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UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

)
PENUMBRA, INC.,)
)
Petitioner,)
)
vs.) IPR2022-00608
) Patent No.
RAPIDPULSE, INC.,) 10,722,253
)
Patent Owner.)

REMOTE DEPOSITION OF
BRIAN BROWN
Friday, December 9, 2022
Volume I

Reported by:
ALEXIS KAGAY
CSR No. 13795
Job No. 5618487
PAGES 1 - 100

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
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5 _____)
6 PENUMBRA, INC.,)
7)
8 Petitioner,)
9)
10 vs.) IPR2022-00608
11) Patent No.
12 RAPIDPULSE, INC.,) 10,722,253
13)
14 Patent Owner.)
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Remote deposition of BRIAN BROWN, Volume I,
taken on behalf of Patent Owner, with all participants
appearing remotely, beginning at 9:37 a.m. and ending
at 12:29 p.m., on Friday, December 9, 2022, before
ALEXIS KAGAY, Certified Shorthand Reporter No. 13795.

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INDEX

WITNESS

EXAMINATION

BRIAN BROWN

Volume I

BY MS. GORDON

6

EXHIBITS

(None.)

1 Friday, December 9, 2022

2 9:37 a.m.

3
4 BRIAN BROWN,

5 having been administered an oath, was examined and
6 testified as follows:

7
8 EXAMINATION

9 BY MS. GORDON:

10 Q Good morning. Could you state your full name
11 for the record.

12 A Brian J. Brown.

13 Q All right. Thank you, Mr. Brown.

14 My name is Lori Gordon, and you and I have
15 been in this position, probably about six months ago,
16 but as you know, I represent Patent Owner RapidPulse,
17 and I will be taking your deposition here today.

18 You understand that you are here today
19 regarding the testimony you provided by declaration in
20 the United States Patent and Trademark Office
21 associated with the inter partes review of U.S. Patent
22 No. 10,722,253?

23 A I do.

24 Q Okay. And for purposes of today's deposition,
25 can we refer to that document as Deville 253?

Page 6

1 A We can.

2 Q All right. And earlier this year, you were
3 deposed on testimony you provided associated with
4 U.S. Patent No. 10,531,883; is that correct?

5 A Correct.

6 Q And that patent is related to the Deville 253
7 patent; correct?

8 A It is related, yes.

9 Q Thank you.

10 Mr. Brown, where are you physically located
11 today?

12 A I am in my home in Hanover, Minnesota.

13 Q Okay. And is there anyone else in the room
14 with you today?

15 A There is not.

16 Q All right. So I'd like to go over a few
17 ground rules for this, -- today's deposition.

18 I'm going to ask you questions, and if, for
19 any reason, the question is not clear, perhaps because
20 the audio link freezes or some platform-related issue
21 or you just don't understand the question, please let
22 me know, and I will reframe and restate the question.

23 Does that sound reasonable to you?

24 A It does.

25 Q All right. And during today's deposition, if

1 you need to take break, let me or your attorney know,
2 and we will finish off any pending questions and
3 proceed with the break.

4 Does that sound reasonable to you?

5 A It does.

6 Q All right. Is there any reason that you
7 cannot give truthful and accurate testimony here today?

8 A Not that I'm aware of.

9 Q All right. So, Mr. Brown, did you prepare for
10 today's deposition?

11 A I did.

12 Q And how did you prepare?

13 A I reviewed a number of the documents.

14 Q Okay. And what documents did you review?

15 A I reviewed my declaration and documents
16 referenced in my declaration.

17 Q And those are the documents listed in the
18 exhibit list to your declaration?

19 A A number of the ones on the exhibit list.

20 Q Okay. Do you recall what precise documents
21 you reviewed in preparation for today's deposition?

22 A I do.

23 Q Okay. Can you list them for me, please.

24 A Would you like them listed by exhibit number
25 or by title?

1 Q Can you list them by both exhibit number and
2 title?

3 A I can. I'm going to take a look here at the
4 list of exhibits.

5 Q All right. So are you accessing your
6 declaration in this proceeding?

7 A I am, yes.

8 Q All right. So let me enter that into the
9 deposition.

10 So, Mr. Brown, can you please pull up
11 Declaration of Brian Brown in Support of Petition for
12 Inter Partes Review of U.S. Patent No. 10,722,253,
13 which has been given the exhibit number 1005 in this
14 proceeding.

15 Do you have that in front of you?

16 A I do now.

17 Q Okay. And is this one of the documents you
18 reviewed in preparation for today's deposition?

19 A It is.

20 Q All right. Thank you.

21 And if you would please turn to the exhibit
22 list and let me know which other exhibits you reviewed
23 in preparation for today's deposition?

24 A Okay. I am on the list of exhibits.

25 Q On page --

1 A I reviewed page 1.

2 And the exhibits that I reviewed would be
3 Exhibit 1001, which is a U.S. patent, which we have
4 agreed to call the Deville 253.

5 Q Okay.

6 A Exhibit 1002, which I referred to as the
7 Deville Provisional No. 1.

8 Exhibit 1003, which is Deville Provisional
9 No. 2.

10 Exhibit -- I did not review 1004.

11 Exhibit 1005, I reviewed, which is the
12 document that we are looking at right now.

13 I did not review Exhibit 1006, which is my CV.

14 I did review Exhibit 1007, which is Teigen
15 Patent 683.

16 I reviewed Exhibit 1008, which is Teigen
17 Provisional 1.

18 I -- I reviewed Exhibit 1009, which is Teigen
19 Provisional 2.

20 I reviewed 1011, which is Rubenstein 574.

21 Q Okay. And you did not review 1010, 1010?

22 A You are correct. I did skip that one.

23 I did review 1010, which is the Grey 209.

24 Q Okay.

25 A And I reviewed 1012, which is Yang 953.

1 And I reviewed 1013, which is Matteo 833.

2 And that is all.

3 Q Okay. And do you have copies of each of those
4 documents with you here today?

5 A I do.

6 Q Okay. And these are clean copies; correct?

7 A Correct. These are clean copies that were
8 just to me.

9 Q Okay. So in addition to reviewing the
10 documents, did you meet with anybody to prepare for
11 today's deposition?

12 A I did.

13 Q And who did you meet with?

14 A I met with counsel from Baker Botts.

15 Q Okay. And did you meet with anyone else in
16 preparation for today's deposition?

17 A I believe William -- I think it's -- is it
18 Yeel? -- from Penumbra.

19 Q Okay. And is that --

20 MR. ODA: William Yee.

21 BY MS. GORDON:

22 Q Okay. All right. So Mr. Lee from Penumbra in
23 your preparation meetings?

24 A He attended them, yes.

25 Q Okay. And how many meetings did you have to

1 prepare for today's deposition?

2 A Two.

3 Q All right. And approximately how many hours
4 did you spend meeting with counsel to prepare for
5 today's deposition?

6 A Approximately three.

7 Q And is that three hours total, across the two
8 meetings?

9 A Yes.

10 Q Okay. And how many hours did you spend,
11 approximately, reviewing the documents outside of the
12 meetings to prepare for today's deposition?

13 A Approximately 12.

14 Q So about 15 hours total to prepare for today's
15 deposition?

16 A Yes.

17 Q Okay. And the paper copies you have of the
18 exhibits that you referenced, have you made any
19 markings on these exhibits?

20 A I have not.

21 Q Okay. Okay. So let's turn to Exhibit 1005
22 that you have in front of you.

23 If you could turn to paragraph 1.

24 A Okay.

25 Q In this paragraph, you state (as read):

1 "I have prepared this declaration as
2 an expert witness retained by
3 Penumbra, Inc."

4 When were you retained by Penumbra in
5 connection with preparing testimony for this specific
6 IPR proceeding?

7 A I believe it was the fall of 2020.

8 Q So in the fall of 2020, you were engaged by
9 Penumbra to prepare testimony against both the 883
10 Deville patent and the 253 Deville patent?

11 MR. ODA: Objection; form.

12 MS. GORDON: I'm sorry, Mr. Oda, I didn't hear
13 your objection.

14 MR. ODA: I said, "Objection; form."

15 MS. GORDON: Okay. Thank you.

16 THE WITNESS: I was contacted by a search firm
17 in the fall of 2020, and -- a search firm by the name
18 of, I believe, IMS. And then they connected me up with
19 Baker Botts to serve as an expert witness on this case,
20 and in that particular time, it was just for the 883
21 patent.

22 BY MS. GORDON:

23 Q Okay. So when you were first contacted,
24 through IMS, by Baker Botts in the fall of 2020, it was
25 for the 883 patent; correct?

1 A Correct.

2 MR. ODA: Objection; form.

3 BY MS. GORDON:

4 Q And when were you asked by Penumbra to provide
5 opinions and a declaration on the Deville 253 patent?

6 A I don't recall exactly when it was. I believe
7 it was somewhere around the middle of 2021.

8 Q Okay. So in the summer of 2021, you were
9 asked to start work on your opinions on the 253 patent?

10 A I am -- I'm somewhat speculating. I don't
11 know for sure exactly when I started, but I believe it
12 was roughly in that timeframe.

13 Q Okay. Thank you.

14 And have you been engaged by Penumbra to
15 consult on any matter besides the present IPR and the
16 IPR filed against the 883 patent?

17 A I have not.

18 Q And other than counsel for Penumbra, from
19 Baker Botts, and Mr. Yee, who you mentioned in one of
20 your earlier answers, have you spoken to anyone
21 regarding the subject matter of the present IPR?

22 A I have not.

23 Q Can you turn to page 169 of your declaration.

24 A I am there.

25 Q All right. And, Mr. Brown, did you insert the

1 signature into the document yourself?

2 A I do not recall whether I inserted it or
3 whether I authorized it to be inserted.

4 Q Okay. And when you say "authorized it to be
5 inserted," what do you mean by that?

6 MR. ODA: Objection; form.

7 THE WITNESS: I reviewed this document and
8 agreed that it was saying what I wanted it to say and
9 that it was ready for my signature, and so I authorized
10 my signature to be applied to it.

11 BY MS. GORDON:

12 Q So counsel from Baker Botts has a copy of your
13 signature that they can insert into documents?

14 A I -- yes, I forwarded a copy of my electronic
15 signature to them to put into this, whether it be this
16 document...

17 Like I said, I don't recall whether I inserted
18 it or they did, but they do have a copy of my
19 signature.

20 Q Okay. And do you recall whether you
21 authorized your signature to be inserted on
22 February 2nd, 2022?

23 MR. ODA: Objection; form.

24 THE WITNESS: Being that is the date on this
25 document, I would say, yes, that was the day that I

1 authorized it.

2 BY MS. GORDON:

3 Q Okay. But do you -- do you have a copy of an
4 e-mail or anything that would confirm that was the date
5 when your signature -- you authorized or inserted the
6 signature into this document?

7 MR. ODA: Objection; form.

8 THE WITNESS: I do not have a copy of that
9 e-mail, if there is an e-mail.

10 BY MS. GORDON:

11 Q Okay. And how would you have -- if there is
12 no e-mail, how would you have authorized the counsel
13 from Baker Botts to use your signature in this
14 document?

15 MR. ODA: Objection; form.

16 THE WITNESS: Well, first of all, as I said
17 earlier, I don't recall whether they put it in or I put
18 it in, but it is my signature, and it does represent
19 the fact that I agree with what's in this document and
20 approve it.

21 BY MS. GORDON:

22 Q So you reviewed the document and confirmed
23 that this was, in fact, the document you approved for
24 signature?

25 MR. ODA: Objection; form.

1 THE WITNESS: Yes, this -- this is my
2 document. I've -- I've signed it, that this -- that
3 per my declaration up above, I have signed this.

4 BY MS. GORDON:

5 Q Right. But I believe your testimony was you
6 don't recall whether you actually signed this or
7 authorized a third party to insert your signature, so
8 I'm just trying to make sure that this is actually the
9 document that you approved --

10 MR. ODA: Objection; form.

11 BY MS. GORDON:

12 Q -- and no -- and no changes have been made.

13 A I -- I have reviewed this document. This is
14 the document that I authorized and that I put a
15 signature on.

16 Q But again, I believe your testimony was that
17 you don't recall that you actually put the signature
18 into this document; correct?

19 MR. ODA: Objection; form, not a question.

20 THE WITNESS: I said that I do not recall
21 whether I placed the signature on this document or
22 whether I authorized the signature on this document.

23 BY MS. GORDON:

24 Q Okay. And you don't recall whether there's an
25 e-mail documenting how this declaration was signed by

1 you?

2 MR. ODA: Objection; form, asked and answered.

3 THE WITNESS: That is correct.

4 BY MS. GORDON:

5 Q Okay. So turning to paragraph 12, in this
6 paragraph, you state (as read):

7 "I have considered information from
8 various sources in forming my
9 opinions."

10 What sources of information did you consider?

11 A I considered the exhibits that we spoke of
12 earlier. That would be the primary ones.

13 Q And other than the exhibits we spoke of
14 earlier, were there any other materials you considered
15 in forming your opinion in this proceeding?

16 A Yes. The other ones that are on the list of
17 exhibits.

18 Q Okay. Okay. And the materials on the list of
19 exhibits for the declaration against the Deville 253
20 patent are the same as the list of exhibits, with the
21 exception, of course, of the Deville 253 patent and the
22 Teigen 683 -- hold on. Let me strike that because that
23 question is getting long and I'm just anticipating
24 Mark's objection.

25 So are the list of exhibits that you

1 considered for the 253 coextensive with the list of
2 exhibits you considered for the Deville 883 IPR
3 proceeding?

4 MR. ODA: Objection; form.

5 THE WITNESS: I do not recall. I did not do a
6 comparison of the two documents.

7 BY MS. GORDON:

8 Q Okay. Do you recall if there was any exhibits
9 you considered for the Deville 253 IPR that were not
10 considered for the Deville 883 IPR?

11 A Not that I recall.

12 Q And, Mr. Brown, did you draft the declaration
13 for this IPR proceeding?

14 A I drafted it in conjunction with counsel.

15 Q Okay. And approximately how many hours did
16 you spend preparing the declaration specifically for
17 the Deville 253 proceeding?

18 A I would say approximately 16 hours.

19 Q 16. And that's 16 hours in addition time that
20 you had spent drafting the Deville 883 declaration;
21 correct?

22 MR. ODA: Objection to form and scope.

23 THE WITNESS: Correct.

24 BY MS. GORDON:

25 Q Okay. And you would agree that there's

1 significant overlap between your declaration submitted
2 in the Deville 883 proceeding and the declaration in
3 the current proceeding?

4 MR. ODA: Objection; form, scope.

5 THE WITNESS: There are -- if you want to use
6 the word "overlap," they are similar, yes.

7 BY MS. GORDON:

8 Q So, Mr. Brown, they're more than just similar;
9 right? There's -- a large majority of your declaration
10 is identical; correct?

11 MR. ODA: Objection; form, scope,
12 argumentative.

13 THE WITNESS: As I mentioned earlier, I did
14 not compare the two documents. Many of the arguments
15 are similar because they are arguing the exact same
16 points.

17 BY MS. GORDON:

18 Q Okay. So let's turn now to paragraph 51.

19 A I am there.

20 Q Okay. And in this paragraph, you mention the
21 use of catheter-based thrombectomy systems.

22 Do you see that?

23 A Yes.

24 Q All right. And in this paragraph, you say (as
25 read):

1 "These systems are used in veins, as
2 in the case of deep vein thrombosis,
3 and in arteries, in the case of
4 pulmonary embolism, ST-elevated
5 myocardial infraction --
6 infarction" -- sorry -- "and ischemic
7 stroke."

8 Mr. Brown, how would you define deep vein
9 thrombosis?

10 A It is thrombus formation in the deep veins.

11 Q Okay. And what would be considered a deep
12 vein?

13 MR. ODA: Objection; form.

14 THE WITNESS: Deep veins are typically defined
15 as the veins of the lower extremities of the body.

16 BY MS. GORDON:

17 Q Okay. So that would be the legs?

18 A Correct.

19 Q Okay.

20 A That is -- yes, legs would be included in
21 that.

22 Q And what else would be included?

23 MR. ODA: Objection; form.

24 THE WITNESS: It could include the pelvic
25 region.

1 BY MS. GORDON:

2 Q Okay. And could it include other regions?

3 MR. ODA: Objection; form.

4 THE WITNESS: It may. Those are the two that
5 I can think of right now.

6 BY MS. GORDON:

7 Q Okay. And how would you define a pulmonary
8 embolism?

9 A A pulmonary embolism is embolic material that
10 is in the pulmonaries system.

11 Q Okay. And that's the lung; is that correct?

12 MR. ODA: Objection; form.

13 THE WITNESS: Yes, the lung is the primary
14 description of the pulmonary system.

15 BY MS. GORDON:

16 Q Okay. And is there another description of the
17 pulmonary system?

18 MR. ODA: Objection; form.

19 THE WITNESS: It could include possibly some
20 of the airways or the arteries leading to the lung.

21 BY MS. GORDON:

22 Q Okay. And in your experience, what are the
23 differences between deep vein thrombosis and pulmonary
24 embolism?

25 MR. ODA: Objection; scope.

1 THE WITNESS: Deep vein thrombosis is thrombus
2 in the deep veins. Pulmonary embolism are emboli that
3 are in the pulmonary system.

4 BY MS. GORDON:

5 Q Okay. And in your experience, is there a
6 difference between the vessel size involved in deep
7 vein thrombosis and in pulmonary embolism?

8 MR. ODA: Objection; form and scope.

9 THE WITNESS: The vessel size throughout the
10 body varies, so there's a range of vessel sizes in the
11 deep veins, and there's a range of vessel sizes in the
12 pulmonary system.

13 BY MS. GORDON:

14 Q Okay. And is -- what is the typical range for
15 vessels in the deep veins?

16 MR. ODA: Objection; form and scope.

17 THE WITNESS: They can be as small as the
18 capillaries, all the way up to, I believe, around maybe
19 18 millimeters in diameter.

20 BY MS. GORDON:

21 Q Okay. You said around 18 millimeters in
22 diameter?

23 A Correct.

24 Q Okay. And in your experience, what are the
25 ranges of size of vessels in the pulmonary system?

1 MR. ODA: Objection; scope.

2 THE WITNESS: Again, they can be as small as
3 capillaries. I believe they can go as high as maybe
4 10, 15 millimeters in diameter.

5 BY MS. GORDON:

6 Q Okay. So the upper end of the range would be
7 smaller than the venous system?

8 MR. ODA: Objection; form, scope.

9 THE WITNESS: A little bit.

10 BY MS. GORDON:

11 Q Okay. And is there a difference in the risk
12 of distal migration of a thrombus between a deep vein
13 thrombosis application and a pulmonary embolism
14 application?

15 MR. ODA: Objection; form and scone.

16 THE WITNESS: Can I have the question reread,
17 please?

18 BY MS. GORDON:

19 Q Yes. And let me maybe break it down.

20 What is your understanding of distal migration
21 of a thrombus?

22 A Distal migration of a thrombus is thrombus
23 that breaks free from its original site and moves
24 distally.

25 ///

1 BY MS. GORDON:

2 Q Okay. And in a catheter-based thrombectomy
3 system that's treating deep vein thrombosis, is there a
4 difference in the risk of migration, distal migration
5 of the thrombus, from a system that is treating
6 pulmonary embolism?

7 MR. ODA: Objection; form.

8 THE WITNESS: The pulmonary embolism is
9 typically the distal migration of the deep vein
10 thrombosis. And so when you speak of migration of a
11 pulmonary embolism, it -- it already is the distal
12 migration of something else.

13 BY MS. GORDON:

14 Q All right. So let's maybe step back; right?

15 So if you're using a catheter-based
16 thrombectomy system to treat deep vein thrombosis,
17 where would the thrombus be located during that
18 treatment, typically?

19 MR. ODA: Objection; form and scope,
20 incomplete hypothetical.

21 THE WITNESS: So the site that the -- that
22 deep vein thrombosis typically occurs, we have already
23 reviewed, which is the lower extremities.

24 BY MS. GORDON:

25 Q Right. So when you're using a catheter-based

1 thrombectomy system, to treat or address deep vein
2 thrombosis, then the catheter would -- the thrombus
3 would be, for example, in the lower leg; correct?

4 MR. ODA: Same objection.

5 THE WITNESS: It would be in the legs or in
6 the pelvic region.

7 BY MS. GORDON:

8 Q Okay. So in those applications, the catheter
9 would be brought to the location of the thrombus, in
10 the lower leg; correct?

11 MR. ODA: Same objection.

12 THE WITNESS: Correct.

13 BY MS. GORDON:

14 Q Okay. And is there risk of distal migration
15 if you're performing a catheter-based thrombectomy for
16 a deep vein thrombosis condition in the leg?

17 MR. ODA: Objection; form and scope,
18 incomplete hypothetical.

19 THE WITNESS: There is a risk of distal
20 migration.

21 BY MS. GORDON:

22 Q Okay. And I believe, in your earlier
23 testimony, you testified that pulmonary embolism is the
24 distal migration of another condition. For example, I
25 believe you mentioned deep vein thrombosis.

1 Does that mean there's no further distal
2 migration possible in a pulmonary embolism?

3 MR. ODA: Same objection.

4 THE WITNESS: There is more distal migration
5 possible.

6 BY MS. GORDON:

7 Q Okay. And how would the additional distal
8 migration typically occur when you're treating a
9 pulmonary embolism?

10 MR. ODA: Same objection.

11 THE WITNESS: If that embolism were to be
12 broke up, made smaller, then there's a risk of it
13 migrating distally.

14 BY MS. GORDON:

15 Q Okay. And when a thrombus migrates distally
16 in the arteries, is the risk as severe as -- or is
17 the -- strike that.

18 When a thrombus migrates distally in the
19 venous system, is the risk as severe as when a thrombus
20 migrates distally in the arterial system?

21 MR. ODA: Objection; form.

22 THE WITNESS: It is, yes.

23 BY MS. GORDON:

24 Q Okay. And can you explain to me why that is
25 the case?

1 A In the venous system, distal migration of
2 emboli can travel to the lungs, and if it travels to
3 the lungs, in large enough quantities, it can occlude
4 the blood vessels within your lungs; therefore, you are
5 not able to transfer oxygen in and out of the body, and
6 you suffocate.

7 Q Okay. And what is the impact of distal
8 migration in the arterial system?

9 MR. ODA: Objection; form.

10 THE WITNESS: A similar mechanism, as far as
11 particles traveling distally into the small
12 vasculature, occluding it and then starving your
13 muscles of oxygen and nutrients.

14 BY MS. GORDON:

15 Q So is it only the muscles that are impacted
16 when you have distal migration of a thrombus in the
17 arteries?

18 MR. ODA: Objection; form.

19 THE WITNESS: Muscles, organs, living tissue.

20 BY MS. GORDON:

21 Q Okay. So what is the size of vessels where
22 aspiration is generally used to treat deep vein
23 thrombosis?

24 MR. ODA: Same objection.

25 THE WITNESS: I believe I said earlier that

1 deep vein thrombosis can be from very small up to
2 18 millimeters in diameter.

3 As far as size of vessels that are treated, it
4 would probably range in maybe the 3 millimeters up to
5 the 18 millimeters.

6 BY MS. GORDON:

7 Q Okay. And for pulmonary embolism, what are
8 the size of vessels where aspiration is -- well,
9 strike -- let me ask that again.

10 What are the size of the vessels where
11 aspiration is generally used to treat pulmonary
12 embolisms?

13 MR. ODA: Objection; form, scope.

14 THE WITNESS: That is an area I'm less
15 familiar with, so I'm unable to give you a size range
16 there.

17 BY MS. GORDON:

18 Q Okay. In paragraph 51, you also mentioned a
19 condition called ST elevation myocardial infarction.

20 How would you define an ST elevation
21 myocardial infarction?

22 A So ST is referring to the ST portions of an
23 EKG reading, and when those get elevated, during the --
24 and EKG procedure -- when I say "procedure," where they
25 are taking a reading of your EKG -- when those are

1 elevated, that is an indication that you are having a
2 myocardial infarction.

3 Q Okay. So that would be indicative of a
4 blocked coronary artery?

5 MR. ODA: Objection; form.

6 THE WITNESS: Correct.

7 BY MS. GORDON:

8 Q Okay. And in this paragraph, you're stating
9 that catheter-based thrombectomy systems are used to
10 treat that condition; correct?

11 MR. ODA: Objection; form.

12 THE WITNESS: Correct.

13 BY MS. GORDON:

14 Q Okay. How would you define an ischemic
15 stroke?

16 A An ischemic stroke would be a stroke
17 associated with a blockage of a cerebral neurovascular
18 artery.

19 Q Okay. All right. And in your experience,
20 ischemic strokes are treated using catheter-based
21 thrombectomy systems?

22 MR. ODA: Objection; form and scope.

23 THE WITNESS: They are.

24 BY MS. GORDON:

25 Q And what are the size -- sizes of vessels

1 where aspiration is generally used to treat an ischemic
2 stroke?

3 MR. ODA: Same objection.

4 THE WITNESS: I would say it would range from
5 2 millimeters up to maybe 12 millimeters.

6 BY MS. GORDON:

7 Q Okay. And when a catheter-based thrombectomy
8 system is used to treat ischemic stroke, what is the
9 risk of distal migration of the thrombus in that case?

10 MR. ODA: Same objection.

11 THE WITNESS: So you're asking what is the
12 risk associated with the procedure?

13 BY MS. GORDON:

14 Q That was my initial question, yes.

15 A The risk would be that the thrombus would
16 break free and travel more distal, which then would
17 make it more difficult to retrieve.

18 Q All right. And what is the impact of distal
19 migration when you're treating ischemic stroke?

20 MR. ODA: Objection; form, scope.

21 THE WITNESS: The loss of brain tissue.

22 BY MS. GORDON:

23 Q Is that the only potential impact?

24 MR. ODA: Objection; form.

25 THE WITNESS: It can also affect the muscles

1 to your face. It can affect your hearing.

2 BY MS. GORDON:

3 Q Is there any -- any other impact of distal
4 migration?

5 MR. ODA: Objection; form.

6 BY MS. GORDON:

7 Q When you're treating a -- when you're using it
8 in a cerebral vessel.

9 A Those are the ones that I can think of.

10 Q All right. So you wouldn't consider patient
11 death to be a risk of distal migration when treating
12 ischemic stroke with a catheter-based thrombectomy
13 system?

14 MR. ODA: Objection; form and scope,
15 argumentative.

16 THE WITNESS: That would be included in one of
17 the complications of brain tissue death.

18 BY MS. GORDON:

19 Q Okay. So the ultimate complication is patient
20 death; would that be fair to say?

21 A It would --

22 MR. ODA: Objection; form.

23 THE WITNESS: It would be the worst
24 complication.

25 ///

1 BY MS. GORDON:

2 Q In this paragraph, you also mention a dialysis
3 arteriovenous graft.

4 What is your definition of that term?

5 A A dialysis graft is a passageway between your
6 arterial side and your venous side, where clinicians
7 can do -- can access your blood to do dialysis.

8 Q Okay. And why are these grafts prone to
9 thrombus formation, in your opinion?

10 MR. ODA: Objection; form.

11 THE WITNESS: One, they are not native, and so
12 they are somewhat foreign to the body, and sometimes
13 they do not have the proper flow rate to maintain
14 patency.

15 BY MS. GORDON:

16 Q Okay. And what is typically the size of the
17 grafts that are treated using aspiration when you're
18 discussing a dialysis arteriovenous graft?

19 MR. ODA: Objection; form, scope.

20 THE WITNESS: I believe these are in the 8- to
21 10-millimeter diameter range.

22 BY MS. GORDON:

23 Q Okay. And in paragraph 51, you state that
24 catheter-based thrombectomy systems are used in the
25 treatment of the conditions we've been discussing, deep

1 vein thrombosis, pulmonary embolism, ST-elevated
2 myocardial infarction and ischemic stroke.

3 Are there any differences in the
4 catheter-based systems used to treat each of these
5 conditions?

6 MR. ODA: Objection; form, scope.

7 THE WITNESS: There are different types of
8 thrombectomy catheters and -- so even for each one of
9 these clinical situations that we're talking about
10 here, there could be numerous different types of
11 thrombectomy catheters used.

12 It really depends on the condition of the
13 thrombus that you're trying to treat, the size of the
14 vessel, and, as we discussed, there's a range of sizes
15 for each one of these. There's -- there's different
16 forms of thrombus that can be in each one of these.

17 So it's up to the clinician to decide which
18 catheter and which technique to use for each situation.

19 BY MS. GORDON:

20 Q Okay. So you said there are different types
21 of thrombectomy catheters.

22 What types of thrombectomy catheters are
23 available?

24 MR. ODA: Same objection.

25 THE WITNESS: There are aspiration catheters.

1 There are mechanical thrombectomy catheters. There are
2 lytic catheters.

3 BY MS. GORDON:

4 Q Uh-huh. Okay. And I believe, in your answer,
5 you also said the form of the thrombus could vary in
6 each of these conditions.

7 Is that an accurate restatement of your
8 testimony?

9 MR. ODA: Objection; form.

10 THE WITNESS: Yes, the form of the thrombus
11 can vary within each of these conditions.

12 BY MS. GORDON:

13 Q I see. And how would the form of the thrombus
14 vary within -- let's start with the deep vein
15 thrombosis condition.

16 MR. ODA: Objection; form, scope, incomplete
17 hypothetical.

18 THE WITNESS: The form that I'm going to
19 describe would not be exclusive just to deep vein
20 thrombosis. This would apply to all of these
21 conditions. It really depends upon the age of the
22 thrombus. And so if it's relatively new and what is
23 typically referred to as fresh, it's much softer, much
24 more jellylike. As it gets older, it organizes,
25 becomes much more fibrous, much more difficult to -- to

1 remove than the soft, jellylike thrombus.

2 BY MS. GORDON:

3 Q Okay. Can you explain to me the difference
4 between aspiration, mechanical and lytic catheters?

5 MR. ODA: Objection; form.

6 THE WITNESS: The difference between those two
7 is that an aspiration mechanical thrombectomy catheter
8 is removing the thrombus, typically with some type of
9 mechanical system helping it, whereas as a lytic
10 catheter is infusing lytics to dissolve the thrombus.

11 BY MS. GORDON:

12 Q So my understanding is you were describing
13 three different types of catheters, an aspiration
14 catheter, a mechanical catheter and a lytic catheter.

15 In your answer, you were referring to an
16 aspiration mechanical catheter.

17 Is that different from the aspiration catheter
18 that you mentioned in your earlier answer?

19 MR. ODA: Objection; form.

20 THE WITNESS: It is different in the fact that
21 it combines some type of mechanism with the aspiration.

22 BY MS. GORDON:

23 Q Okay. So what is an aspiration catheter?

24 A In its simplest form, it is a tube that has --
25 that the fluids are being aspirated through.

1 Q Okay. And what fluids are typically aspirated
2 through an aspiration catheter?

3 MR. ODA: Objection; form.

4 THE WITNESS: It could be any bodily fluid.

5 BY MS. GORDON:

6 Q Okay. And what would that include?

7 MR. ODA: Objection; form.

8 THE WITNESS: Well, in the -- in the case that
9 we are refer- -- we are discussing today, it would
10 include blood. It would include thrombus.

11 BY MS. GORDON:

12 Q Okay. And would blood be considered to be an
13 incompressible fluid, with respect to aspiration?

14 MR. ODA: Objection; form.

15 THE WITNESS: Yes.

16 BY MS. GORDON:

17 Q Okay. And would an aspiration catheter system
18 ever use saline?

19 MR. ODA: Objection; form, incomplete
20 hypothetical.

21 THE WITNESS: It can.

22 BY MS. GORDON:

23 Q Okay. And is saline considered to be an
24 incompressible fluid with respect to aspiration?

25 MR. ODA: Objection; form.

1 THE WITNESS: Typically, yes.

2 BY MS. GORDON:

3 Q Okay. When you say "typically," what do you
4 mean by that?

5 MR. ODA: Same objection.

6 THE WITNESS: As long as it's in its liquid
7 form.

8 BY MS. GORDON:

9 Q I see. And would you ever use saline not in a
10 liquid form in an aspiration application?

11 MR. ODA: Objection; form, incomplete
12 hypothetical.

13 THE WITNESS: Not that I'm aware of.

14 THE REPORTER: Mr. Oda, your objections are
15 fading out at the end.

16 MR. ODA: Sorry, I'll speak up.

17 THE REPORTER: Thanks.

18 BY MS. GORDON:

19 Q All right. So I'd like to turn to
20 Exhibit 1007, which is U.S. Patent 11,197,683, which
21 has been marked as Exhibit 1007 in this proceeding.

22 Do you have a clean copy of that document?

23 A I do.

24 Q Okay. And this was, I believe, one of the
25 documents you listed as a document you reviewed in

1 preparation for today's deposition; correct?

2 A Correct.

3 Q All right. So could I turn your attention to
4 column 2 and particularly the paragraph that starts on
5 line 27 and runs through line 48.

6 A I am there.

7 Q Okay. In line 31 of this paragraph, it
8 mentions a large aspiration catheter.

9 Do you see that?

10 A I do see a reference to an especially large
11 aspiration catheter, yes.

12 Q Okay. Is it a reference to an especially
13 large aspiration catheter or especially when using
14 large aspiration catheters?

15 A It is what you just said.

16 Q Okay. The latter portion of what I just said;
17 correct?

18 A Correct, yes.

19 Q Okay. And in your experience, what would be
20 considered a large aspiration catheter?

21 MR. ODA: Objection; form.

22 THE WITNESS: Well, you're asking for my
23 opinion of a large aspiration catheter, or are you
24 asking me to define what it means here in the 683
25 patent?

1 BY MS. GORDON:

2 Q Well, let's do both.

3 Let's start with, in your opinion, what would
4 you consider to be a large aspiration catheter?

5 A I would consider it to -- to be something that
6 would be either large in length or large in diameter.

7 Q Okay. And what would you consider to be large
8 in diameter?

9 MR. ODA: Objection; form.

10 THE WITNESS: That is -- that's difficult to
11 answer. I would suspect it would have to relate to
12 each of the cases and what it's being compared to.

13 BY MS. GORDON:

14 Q When you say "each of the cases," what do you
15 mean by that?

16 A So a particular procedure may historically use
17 large diameter devices, and so another device would not
18 be considered to be large in comparison. It would be
19 normal. And so it's kind of what would historically be
20 used.

21 Q All right. So what procedures, historically,
22 would use what's -- strike that.

23 Let me start with a more basic question.

24 What would you consider to be a large
25 diameter in --

1 MR. ODA: Objection; form.

2 BY MS. GORDON:

3 Q -- an aspiration thrombectomy?

4 A Sorry. The -- I'm having a difficult time, as
5 I was explaining before, as far as saying what is
6 large. It's all just relative to what is historically
7 used in that indication.

8 BY MS. GORDON:

9 Q Okay. So in your answer, you say a particular
10 procedure may historically use a large diameter device.
11 So what types of procedures historically used
12 larger diameter devices?

13 MR. ODA: Objection; form, asked and answered.

14 THE WITNESS: Well, as the thrombectomy has
15 evolved, it has gone from what I'll refer to as larger
16 devices to smaller devices and -- mostly due to the
17 level of technology available. And so in the early
18 days, a thrombectomy, the tools that they had available
19 to them were -- were larger in diameter, and as
20 technology has evolved, they've gotten smaller in
21 diameter.

22 BY MS. GORDON:

23 Q So when you're talking about the tools
24 available, are you talking about the catheters
25 themselves?

1 A I am, yes.

2 Q Okay. And when you're using "diameter" in
3 this context, are you referring to the inner diameter
4 of the catheter or the outer diameter of the catheter?

5 A I was referring to the outer diameter.

6 Q Okay. And in these devices, how would the
7 inner diameter relate to the outer diameter?

8 MR. ODA: Objection; form.

9 THE WITNESS: It would be smaller.

10 BY MS. GORDON:

11 Q Okay. And what would -- what factors would
12 impact the amount that the size of the inner diameter
13 was smaller than the size of the outer diameter?

14 MR. ODA: Objection; form.

15 THE WITNESS: The wall thickness of the
16 catheter.

17 BY MS. GORDON:

18 Q Okay. Are there any other factors that impact
19 the inner -- size of the inner diameter, relative to
20 the outer diameter?

21 MR. ODA: Same objection.

22 THE WITNESS: The -- another factor that could
23 influence the inner diameter versus the outer diameter
24 is if it's a single-lumen or dual-lumen catheter.

25 ///

1 BY MS. GORDON:

2 Q Okay. And how does that impact the inner
3 diameter versus the outer diameter?

4 MR. ODA: Same objection.

5 THE WITNESS: If a catheter has dual lumens or
6 multiple lumens, you now are putting more than one
7 lumen down through the center of the catheter.

8 Q Okay. And what applications would use a
9 dual-lumen or double-lumen catheter?

10 MR. ODA: Objection; form, incomplete
11 hypothetical.

12 THE WITNESS: So applications could include
13 thrombectomy.

14 BY MS. GORDON:

15 Q Okay. Any other applications that you can
16 think of here today?

17 MR. ODA: Same objection.

18 THE WITNESS: Yeah, pretty much any catheter
19 used in the human body could be a dual-lumen catheter.

20 BY MS. GORDON:

21 Q And why would a practitioner select a double-
22 or dual-lumen catheter over a single-lumen catheter?

23 MR. ODA: Objection; form and scope,
24 incomplete hypothetical.

25 THE WITNESS: If they needed more than one

1 lumen to perform the procedure, they would have a
2 dual-lumen or multilumen catheter.

3 BY MS. GORDON:

4 Q Okay. And in your earlier answer to my
5 question, I believe you indicated that the diameter of
6 thrombectomy catheters was reducing in size as the
7 technology evolves.

8 Is that a correct summary of your earlier
9 answer?

10 A Yes.

11 Q Okay. And why has the diameter size of
12 catheters for thrombectomy applications changed over
13 the course of history?

14 MR. ODA: Objection; form, scope.

15 THE WITNESS: There are two main reasons.

16 One is the catheters have to enter the body at
17 some point and the -- that entry point usually creates
18 an injury to the body. So the smaller the diameter,
19 the less injury there is.

20 The second reason is that the smaller the
21 diameter, the more flexible the device is, so it's
22 easier to get to the location that you're trying to get
23 to, and you're also able to go more distal into smaller
24 vessels.

25 ///

1 BY MS. GORDON:

2 Q Okay. All right. And we were also talking
3 about the factors that impacted the difference between
4 inner diameter and outer diameter.

5 So other than the factors you've already
6 mentioned, are there any other factors that impact the
7 size of the inner diameter versus the outer diameter of
8 a catheter?

9 MR. ODA: Objection; form and scope.

10 THE WITNESS: I believe I mentioned wall
11 thickness and number of lumens. That -- that is all I
12 can think of right now.

13 BY MS. GORDON:

14 Q Okay. Okay. And can you explain what the
15 French catheter scale is?

16 MR. ODA: Objection; form, scope.

17 THE WITNESS: I can.

18 BY MS. GORDON:

19 Q Okay. And would you, please.

20 A The French scale for catheters is a means to
21 rate the -- the size of a catheter based on the --
22 based on the circumference of the catheter.

23 Q So it's based on the outer circumference of
24 the catheter.

25 A If I'm --

1 MR. ODA: Same objection.

2 THE WITNESS: If I'm remembering correctly,
3 yes, it's based on the circumference of the -- outer
4 circumference of the catheter.

5 BY MS. GORDON:

6 Q Okay. And what is your understanding of the
7 ranges of sizes in the French catheter scale?

8 MR. ODA: Objection; scope.

9 THE WITNESS: It's infinite. I mean, it's --
10 it's just a scale. There is no top or bottom.

11 BY MS. GORDON:

12 Q Okay. So what's your understanding of the
13 size of a, for example, 6 French catheter?

14 MR. ODA: Objection; form and scope.

15 THE WITNESS: A 6 French catheter -- and,
16 again, I'm -- if I'm remembering correctly -- would be
17 a catheter that would have a 6-millimeter
18 circumference.

19 BY MS. GORDON:

20 Q Outer circumference?

21 A Outer circumference, yes.

22 Q Okay. And what is the typical wall thickness
23 of the 6 French catheter?

24 MR. ODA: Same objection.

25 THE WITNESS: There -- there is no typical

1 wall thickness.

2 BY MS. GORDON:

3 Q Okay. And would you consider a 12 French
4 catheter to be a large aspiration catheter?

5 MR. ODA: Same objection.

6 THE WITNESS: Again, it depends on the
7 application. I cannot answer that.

8 BY MS. GORDON:

9 Q Okay. And, Mr. Brown, in your experience, did
10 you design catheters?

11 MR. ODA: Same objection.

12 THE WITNESS: I have designed catheters.

13 BY MS. GORDON:

14 Q Okay. And what size catheters did you design?

15 MR. ODA: Objection; form.

16 THE WITNESS: I have designed the catheters
17 over a very wide range, depending upon the application.

18 BY MS. GORDON:

19 Q Okay. Can you give me an example of an
20 application and the range of sizes of the catheter for
21 that application?

22 MR. ODA: Objection; form.

23 THE WITNESS: I can. We're talking about
24 coronary balloon catheters. They would be -- if we're
25 going to use the French scale, they could be down in

1 the 3 French. If we're talking about structural heart
2 catheters, they could be as large as 24 French.

3 BY MS. GORDON:

4 Q Okay. And did you design or work with
5 thrombectomy catheters?

6 A I did.

7 Q And what were the sizes of the thrombectomy
8 catheters that you worked with in your experience?

9 MR. ODA: Objection; form.

10 THE WITNESS: They were anywhere from -- on
11 the small side, 2 to 3 French, up to 8 or 10 French.

12 BY MS. GORDON:

13 Q Okay. Okay. And would 12 French be
14 considered a large aspiration catheter for an ischemic
15 stroke treatment application?

16 MR. ODA: Objection; form.

17 THE WITNESS: I would say 12 French would be
18 on the larger size for ischemic stroke.

19 BY MS. GORDON:

20 Q Okay. Okay. Would 12 French be considered a
21 large aspiration catheter for treatment of deep vein
22 thrombosis?

23 MR. ODA: Objection to form.

24 THE WITNESS: It depends on what you're
25 treating, what you're trying to aspirate.

1 BY MS. GORDON:

2 Q Okay. And how does it depend on those
3 factors?

4 MR. ODA: Objection; form.

5 THE WITNESS: If the thrombus is well
6 organized, very bulky, a 12 French catheter would be
7 exactly what you'd want to use.

8 BY MS. GORDON:

9 Q Okay. And if thrombus was not well organized
10 or bulky, what size catheter would you want to use?

11 MR. ODA: Objection; form, scope.

12 THE WITNESS: You would choose a catheter that
13 would be appropriate for the size of the vessel, the
14 one that would create the least trauma to the patient,
15 the one that would be able to aspirate out the -- the
16 thrombus.

17 BY MS. GORDON:

18 Q Would you typically -- would that typically be
19 larger or smaller than 12 French?

20 MR. ODA: Same objection.

21 THE WITNESS: Well, as we have been
22 discussing, it would depend upon all the factors
23 that -- that I just reviewed.

24 BY MS. GORDON:

25 Q So in your answer, you said if the thrombus is

1 well organized, very bulky, a 12 French catheter would
2 be exactly what you'd want to use.

3 Why would that be exactly what you'd want to
4 use if the thrombus is well organized?

5 MR. ODA: Same objection.

6 THE WITNESS: Because it -- the more organized
7 it is, the more difficult it is to break up, which
8 means that the particles, or -- or the thrombus is
9 going to be larger in size, and so you'll need a larger
10 catheter.

11 BY MS. GORDON:

12 Q All right. Thank you.

13 Are aspiration catheters typically specified
14 by their inner diameter or by their outer diameter?

15 A Catheters, in general, are typically sized by
16 their outer diameter.

17 MS. GORDON: Okay. So, Mark, we've been going
18 a little over an hour.

19 Would now be a good time to take a short
20 break?

21 MR. ODA: Sounds good. Yeah, let's take a
22 break and go off the record.

23 MS. GORDON: Okay.

24 (Recess.)

25 ///

1 BY MS. GORDON:

2 Q Mr. Brown, are you familiar with Penumbra's
3 neuro catheters, RED 62, RED 68 and RED 72?

4 MR. ODA: Objection; form and scope.

5 THE WITNESS: I am not.

6 BY MS. GORDON:

7 Q Okay. All right. So I'd like to turn to
8 paragraph 277 of your declaration.

9 All right. I guess before we turn there,
10 you're -- are you familiar with any of Penumbra's
11 catheters?

12 A I am familiar --

13 MR. ODA: Objection; form, scope.

14 THE WITNESS: I am familiar with the catheters
15 that are discussed in the Teigen patents, as they --

16 BY MS. GORDON:

17 Q Okay.

18 A -- as they are taught in the Teigen patents.
19 Other than that, I am only familiar with the fact that
20 Penumbra has catheters.

21 Q I see. All right. Thank you.

22 All right. So turning to paragraph 277 now of
23 your declaration, in this paragraph, you state --

24 A Sorry, just hang on.

25 Q Oh, sure. Let me know when you're there.

1 A I am ready.

2 Q All right. In the middle of this paragraph,
3 you state (as read):

4 "There are no standardized internal
5 diameters for aspiration catheters, so
6 a POSA would have known that internal
7 catheter diameters can be optimized
8 for particular applications..."

9 How would a person skilled in the art have
10 optimized the internal catheter diameter for a
11 particular application?

12 A It would be very similar to the discussion we
13 had this morning, as far as the clinical site, the size
14 of the vessel, the type of thrombus, all would be
15 factors that would be considered when designing the
16 internal diameter.

17 Q Okay. And if take, as an example, the
18 treatment of ischemic stroke, what would a POSA have
19 looked to to optimize the internal catheter diameter?

20 MR. ODA: Objection; form.

21 THE WITNESS: It would be the same things that
22 I just listed.

23 BY MS. GORDON:

24 Q Okay. And can you give me an example of how a
25 POSA would go about optimizing the internal diameter

1 for -- for a specific application?

2 MR. ODA: Same objection.

3 THE WITNESS: The internal diameter is a
4 function of what the outer diameter is and then, as we
5 mentioned earlier today, the -- the wall thickness and
6 how many lumens there are.

7 Wall thickness is a variable that a designer
8 has the ability to adjust, depending upon material
9 selection. And, of course, material selection is going
10 to be greatly driven by what the performance
11 requirements are of the catheter.

12 Q Okay. Now, when you say "material selection,"
13 what are you referring to there?

14 A The materials of the catheter, that make up
15 the catheter.

16 Q Okay. And what materials would that be?

17 MR. ODA: Objection; form.

18 THE WITNESS: Meaning what types of materials?
19 BY MS. GORDON:

20 Q Right. I'm trying to understand your answer.

21 So when you say the materials of the catheter,
22 what do you mean by that?

23 A I'm referring to the materials that are -- the
24 construction of the catheter, so, as an example, the
25 polymers that are used to make the shaft of the

1 catheter.

2 Q Okay. Anything other than that?

3 MR. ODA: Objection; form.

4 THE WITNESS: Yes. There are other factors
5 and other materials. It could be metals. It could be
6 plastics. It could be composites.

7 BY MS. GORDON:

8 Q Okay. So for a single-lumen catheter, what is
9 the range of wall thicknesses for neuro catheters?

10 MR. ODA: Objection; form.

11 THE WITNESS: Neurovascular catheter wall
12 thickness likely range from a couple thousandths up to
13 maybe ten thousandths of wall thickness.

14 Q Okay. And what unit are you referring to
15 there?

16 A Thousandths of --

17 MR. ODA: Objection --

18 THE WITNESS: -- an inch.

19 MR. ODA: Objection; form.

20 BY MS. GORDON:

21 Q Okay. And, Mr. Brown, I believe you mentioned
22 earlier that you, in your experience in industry,
23 designed catheters; is that correct?

24 A Correct.

25 Q And what applications did you design catheters

1 for?

2 A I designed catheters for coronary angioplasty,
3 coronary stenting, thrombectomy catheters, structural
4 heart catheters, pulmonary stent delivery catheters.

5 Q Okay. And what were the aspects you looked to
6 for the design of the internal diameter of the catheter
7 for thrombectomy applications.

8 MR. ODA: Objection; form.

9 THE WITNESS: It would be the location I was
10 trying to treat, the size of the vessel that I was
11 trying to treat, the type of thrombus I was trying to
12 remove.

13 BY MS. GORDON:

14 Q Okay. And those are the factors you mentioned
15 earlier; correct?

16 A Correct.

17 Q Okay. And for the catheter -- thrombectomy
18 catheters you designed, was there a specific location
19 your work focused on?

20 MR. ODA: Objection; form.

21 THE WITNESS: I believe the indications were
22 all for coronary applications.

23 BY MS. GORDON:

24 Q Okay. Okay. So when designing a catheter for
25 a coronary -- a thrombectomy catheter for a coronary

1 application, what were the typical sizes of the vessels
2 you were trying to treat in your designs?

3 MR. ODA: Objection; form.

4 THE WITNESS: Anywhere from 2 millimeters in
5 diameter up to 5, 6 millimeters in diameter.

6 BY MS. GORDON:

7 Q Okay. And how did those sizes impact the
8 design of the internal diameter for the coronary
9 thrombectomy catheters you were working on?

10 MR. ODA: Objection; form.

11 THE WITNESS: Well, the internal diameter
12 had -- had to fit within those sizes or those vessels,
13 and so depending upon, again, the -- the vessel that
14 we're -- diameter that we're trying to treat, the type
15 of thrombus, all of those factored into the inner
16 diameter.

17 BY MS. GORDON:

18 Q Okay. And would the inner diameter for the
19 application in the 5-millimeter -- strike that.

20 In general, what were the IDs of those
21 catheters?

22 MR. ODA: Same objection.

23 THE WITNESS: I -- I don't recall what the
24 exact diameters were of those catheters.

25 ///

1 BY MS. GORDON:

2 Q Okay. Were the IDs the same for those
3 catheters, regardless of the vessel size?

4 MR. ODA: Objection; form and scope.

5 THE WITNESS: I do not recall if we changed
6 the inner diameter or not, depending upon vessel size.

7 BY MS. GORDON:

8 Q Okay. And did you design different coronary
9 thrombectomy catheters based on thrombus type?

10 A Yes.

11 Q Okay. And how did the design of a coronary
12 thrombectomy catheter, based on thrombus type, differ?

13 MR. ODA: Objection; form.

14 BY MS. GORDON:

15 Q How -- let me ask that again.

16 How did the design of a coronary thrombectomy
17 catheter differ based on thrombus types?

18 A If the thrombus was fresh and soft, you could
19 have a smaller diameter because it's much easier to
20 break it up and aspirate it. If the thrombus is more
21 organized and fibrous, you need to have a larger
22 diameter in order to aspirate it.

23 Q Okay. And in your answer, when you say
24 "diameter," are you talking about inner diameter of the
25 catheter?

1 A I am.

2 Q Okay.

3 A That's what the question was.

4 Q Okay. In paragraph 277, in the sentence that
5 we've been talking about, you cite to U.S. Patent
6 Publication 2017/0238953 to Yang, which has been
7 entered as Exhibit 1012 in this proceeding.

8 Do you have a copy of Yang in front of you?

9 A I do have it accessible to me.

10 Q Okay. And can you access that document for me
11 now?

12 A Okay. I have Yang in front of me.

13 Q Okay. And I believe you testified earlier
14 that Yang was one of the documents you reviewed in
15 preparation for today's deposition; is that correct?

16 A Correct.

17 Q Okay. So in the sentence we've been talking
18 about, that states a POSA would have known that
19 internal catheter diameters can be optimized for
20 particular applications, you further state, "as is
21 taught in Yang," and then you cite to paragraph 67 and
22 68 of Yang to support this conclusion.

23 And how do paragraphs 67 and 68 of Yang
24 support your conclusion?

25 A I will need a minute to read them.

1 Q All right. Please do and let me know when
2 you're ready.

3 A Can I have the question reread?

4 Q Yes. So how do paragraphs 67 and 68 of Yang
5 support your conclusion that a POSA would have known
6 that internal catheter diameters can be optimized for
7 particular applications?

8 A In paragraph 68 of Yang, he lists a number of
9 inner diameters available as design options.

10 Q Okay. And does Yang associate with those
11 ranges of diameters with particular applications?

12 MR. ODA: Objection; form.

13 THE WITNESS: I do not see that in
14 paragraph 68, but I believe Yang does discuss that the
15 catheter that is being disclosed in his patent can be
16 used in a variety of different applications.

17 BY MS. GORDON:

18 Q Okay. And when you're talking about the
19 catheter being disclosed by Yang, that's the
20 telescoping catheter; is that correct?

21 A That is, yes, the title of this patent.

22 Q Okay. And circling back to your declaration,
23 you state that a POSA would have known that internal
24 catheter diameters can be optimized for particular
25 applications, and I'd like to understand in more detail

1 how the ranges in paragraph 68 lead to that conclusion.

2 MR. ODA: Objection; form.

3 THE WITNESS: Yang has a catheter that can be
4 used for a variety of indications, and he is stating
5 that there are a variety of different inner diameters
6 available for treatment of those indications.

7 BY MS. GORDON:

8 Q But does Yang in any way explain how the inner
9 diameter would be optimized for a particular
10 application, which is what you state in your
11 declaration?

12 MR. ODA: Objection; form.

13 THE WITNESS: So -- so Yang -- excuse me.

14 Yang is teaching that thrombectomy catheters
15 can be designed with a range of diameters and that
16 range would apply to his device and the indications for
17 his device, just the same as what I'm saying here and
18 what we've been talking about all morning, how a person
19 of ordinary skill in the art would know that different
20 diameters are required for different applications.

21 BY MS. GORDON:

22 Q Right. So if we take, for example, a deep
23 vein thrombectomy application, we look at paragraph 68
24 of Yang, how would a POSA have known how to optimize
25 the internal catheter diameter for the deep vein

1 thrombosis?

2 MR. ODA: Objection; form.

3 THE WITNESS: Well, as we discussed, it's not
4 just the location. It's all the other factors that we
5 have reviewed this morning.

6 And so just to say deep vein thrombosis, which
7 diameter would you pick, is unrealistic.

8 You have to select the correct diameter for
9 what you're trying to achieve.

10 BY MS. GORDON:

11 Q Right. And where in paragraphs 67 and 68 does
12 Yang disclose or teach the factors that you mention for
13 selecting an inner diameter for a particular
14 application?

15 MR. ODA: Objection; form.

16 THE WITNESS: So in 68, he does not associate
17 a diameter with an indication, but these are the ranges
18 of diameters that are associated with his teachings.

19 BY MS. GORDON:

20 Q When you say "associated with his teachings,"
21 what teachings are you referring to in your answer?

22 MR. ODA: Objection; form.

23 THE WITNESS: I'm referring to the teachings
24 of Yang 953.

25 ///

1 BY MS. GORDON:

2 Q And what would those be?

3 A I would have to spend time reading this to be
4 able to point that out.

5 Q Right. So I'm trying to understand the
6 opinions you set forth your declaration, and in your
7 declaration, you state that (as read):

8 "A POSA would have known that internal
9 catheter diameters can be optimized
10 for particular applications, as is
11 taught in Yang."

12 So when you made that statement, what were you
13 relying on specifically in Yang to support it?

14 A So as taught in Yang, there are applications
15 that his catheter can be used for, and the diameters
16 are listed in paragraph 67 and 68.

17 Q So a person skilled in the art could have
18 selected any of the inner diameters listed in
19 paragraph 68 to treat any of the conditions mentioned
20 by Yang?

21 MR. ODA: Objection; form, incomplete
22 hypothetical.

23 THE WITNESS: Well, I wouldn't say that they
24 could pick any of these diameters, for any indication.
25 For an example, some of these may be too large for some

1 indications.

2 BY MS. GORDON:

3 Q Okay.

4 A Some may be -- some may be too small for other
5 indications.

6 But this is the range of diameters that can be
7 selected from to optimizes for a particular
8 application.

9 Q Right. So these are the available inner
10 diameters that a POSA could select?

11 A That Yang has suggested.

12 Q Right. And how would a POSA, based on the
13 teachings of Yang, have known which of those diameters,
14 in the large number of ranges in paragraph 68, to
15 select for a particular application?

16 MR. ODA: Objection; form.

17 THE WITNESS: They would know based on all the
18 things we have talked about this morning.

19 BY MS. GORDON:

20 Q Right. And where was that stated in Yang?

21 MR. ODA: Objection to form.

22 THE WITNESS: Without reading Yang, I can't
23 point to that.

24 BY MS. GORDON:

25 Q Right. But you only pointed to paragraph 67

1 and 68 in your declaration; correct?

2 A Correct.

3 Q And is that information anywhere in
4 paragraph 67 or 68?

5 MR. ODA: Objection; form, asked and answered.

6 THE WITNESS: I am not seeing it in 67 or 68.

7 BY MS. GORDON:

8 Q Okay. So in paragraph 286 of your
9 declaration, if you could turn to that and let me know
10 when you're finished.

11 A Okay. I am at 286.

12 Q Okay. And in this paragraph, you say (as
13 read):

14 "...a POSA would realize that the
15 claimed catheter lumen internal
16 diameter ranges are well known in the
17 art and cover the entire range of
18 catheters suitable to fit within human
19 blood vessels."

20 And in your opinion, what is the entire range
21 of catheters suitable to fit within human blood
22 vessels?

23 A The entire range would be as small as a
24 capillary, which would be in the submillimeter
25 diameter, all the way up to -- your aorta is probably

1 your largest blood vessel, and that's around
2 25 millimeters in diameter.

3 Q Okay. And how is the volume of fluid in a
4 length of catheter determined?

5 MR. ODA: Objection; form.

6 THE WITNESS: Typically it is determined by
7 the diameter of -- the inner diameter and the
8 cross-sectional area times the length of the section
9 that you're trying to calculate the volume for.

10 BY MS. GORDON:

11 Q Okay. And is there a mathematical equation
12 that is used to determine the volume of fluid in the
13 length of a catheter?

14 MR. ODA: Objection; form, scope.

15 THE WITNESS: There is.

16 BY MS. GORDON:

17 Q Okay. And what is that occasion?

18 MR. ODA: Same objection.

19 THE WITNESS: I believe it would be pi R
20 squared, R being the radius of the inner diameter,
21 times the length.

22 BY MS. GORDON:

23 Q Okay. And how does the size of the inner
24 diameter of a catheter affect the volume of a specific
25 length of catheter?

1 MR. ODA: Same objection.

2 THE WITNESS: The larger the inner diameter,
3 the larger the volume. The smaller the diameter, the
4 smaller the volume.

5 BY MS. GORDON:

6 Q Okay. All right. So I'd like to turn back to
7 paragraph 68 of Yang.

8 A Okay.

9 Q And this paragraph has different ranges for
10 the inner diameter of the distal section of Yang's
11 telescoping catheter; correct?

12 A Correct.

13 Q Okay. From your experience in catheter
14 design, what do these ranges tell you on how each would
15 be applied?

16 MR. ODA: Objection; form.

17 THE WITNESS: I am not understanding the
18 question.

19 BY MS. GORDON:

20 Q All right. Well, let's start with the range
21 of 0.030 inches to about 0.112 inches.

22 Do you see that?

23 A I do.

24 Q Okay. Based on your experience, what does
25 that tell you about the type of applications that range

1 would be applied to?

2 MR. ODA: Objection; form.

3 THE WITNESS: That range could be applied to
4 neurovascular catheters, coronary catheters, peripheral
5 catheters, venous catheters.

6 BY MS. GORDON:

7 Q Okay. Okay. And what about that range led
8 you to that conclusion?

9 MR. ODA: Objection; form.

10 THE WITNESS: That range is commonly used in
11 all those applications.

12 BY MS. GORDON:

13 Q Okay. Okay. And if we go to the end of this
14 paragraph, he mentions a range of 0.070 inches to
15 0.072 inches.

16 In your experience, what application would
17 that catheter range be indicative of?

18 MR. ODA: Objection; form.

19 THE WITNESS: It could be used for all the
20 ones previously listed.

21 BY MS. GORDON:

22 Q Okay. So you would use a catheter in that
23 range for a coronary application?

24 MR. ODA: Objection; form and scope.

25 THE WITNESS: Yes.

1 BY MS. GORDON:

2 Q Okay. And you'd use a catheter of that size
3 for a peripheral application?

4 MR. ODA: Objection; form and scope.

5 THE WITNESS: Yes.

6 BY MS. GORDON:

7 Q Okay. In paragraph 69 of Yang, he teaches
8 that the distal section may be tapered.

9 Do you see that?

10 A Yes, I do.

11 Q And how does tapering the distal portion of a
12 catheter impact the volume of the catheter?

13 MR. ODA: Objection; form, scope.

14 THE WITNESS: It may or may not affect the
15 volume of the catheter.

16 BY MS. GORDON:

17 Q Okay. And how may it impact the volume of the
18 catheter?

19 MR. ODA: Same objection.

20 THE WITNESS: If the inner diameter is
21 tapered, it would affect the volume. If only the outer
22 diameter is tapering, then it would not affect the
23 diameter.

24 BY MS. GORDON:

25 Q I see. Okay.

1 And is there any -- oh, sorry, continue.

2 A Sorry, I think I may have said it may not
3 affect the diameter. It does not affect the volume.

4 Q Okay. So if the inner diameter of the distal
5 section is tapered, it would impact the volume of the
6 catheter; correct?

7 MR. ODA: Objection; form.

8 THE WITNESS: It would affect the volume of
9 the catheter as in comparison to if it were not
10 tapered.

11 BY MS. GORDON:

12 Q And you said that the outer diameter could be
13 tapered and not impact the volume of fluid in the
14 catheters.

15 Is my understanding correct?

16 MR. ODA: Objection; form.

17 THE WITNESS: That is correct.

18 BY MS. GORDON:

19 Q Okay. And under what circumstances would a
20 tapered outer diameter not impact the volume of fluid
21 in the catheter versus a non-tapered design?

22 MR. ODA: Objection; form and scope.

23 THE WITNESS: If the taper on the outer
24 diameter is only on the outer diameter and the inner
25 diameter does not have a taper, then there would be no

1 change in volume in comparison to a catheter without an
2 outer diameter taper.

3 BY MS. GORDON:

4 Q Okay. All right. So I want to turn to the
5 front page of Yang.

6 A Okay.

7 Q And in the abstract, Yang discloses that its
8 catheter includes a control for advancing the distal
9 section from a first, proximally retracted position
10 within the proximal section to a second extended
11 position, extending distally beyond the proximal
12 section.

13 Do you see that?

14 A I do.

15 Q And that describes Yang's use as a telescoping
16 catheter; correct?

17 A I believe that is correct.

18 Q Okay. And the figure that is reproduced on
19 the front page of the patent, that illustrates the
20 telescoping catheter; correct?

21 A I do not recall whether this image is its
22 telescoping catheter or not, but it does appear to be a
23 telescoping catheter.

24 Q Okay. So returning to paragraph 277 of your
25 declaration, in the last sentence, you state (as read):

Page 70

1 "A POSA would have been motivated, in
2 view of the desire to use the combined
3 system in the manner disclosed in
4 Yang..."

5 So is it your opinion, in this paragraph, that
6 a person of skill in the art would have used the
7 combined system of Teigen 683 and Grey in the
8 telescoping manner disclosed by Yang?

9 MR. ODA: Objection; form.

10 THE WITNESS: No.

11 BY MS. GORDON:

12 Q Okay. And what did you mean by this sentence
13 in your declaration?

14 A Yang teaches that you can use a variety of
15 inner diameters for a thrombectomy catheter, and so
16 combining that teaching with the other disclosures is
17 what I'm talking about here.

18 Q Okay. So you say you're using the combined
19 system in the manner disclosed in Yang.

20 So what's the manner of use disclosed in Yang
21 that you're referring to in this sentence?

22 MR. ODA: Objection to form.

23 THE WITNESS: So the combined system is the
24 combined disclosures --

25 BY MS. GORDON:

1 Q Right.

2 A -- that -- right?

3 Q Uh-huh.

4 A And in a manner disclosed in Yang, Yang
5 discloses the use of a variety of different inner
6 diameters.

7 Q Right. But Yang also discloses an exclusive
8 use of a telescoping catheter, correct, that has
9 different inner diameters for its proximal and distal
10 portions; correct?

11 MR. ODA: Objection; form.

12 THE WITNESS: I do not recall whether he is
13 exclusive to just a telescope or a telescope of
14 different diameters between proximal and distal, but
15 Yang teaches a thrombectomy catheter that can have a
16 range of diameters.

17 BY MS. GORDON:

18 Q Okay. And in paragraph 281, you --

19 A Sorry, of what?

20 Q Of your declaration.

21 A Okay.

22 Q -- you highlight the range 0.030 inches to
23 0.112 inches.

24 Is that the range you are relying on for the
25 combination of --

1 MR. ODA: Objection -- oh, sorry.

2 BY MS. GORDON:

3 Q -- Teigen 683, Grey and Yang?

4 MR. ODA: Objection; form.

5 THE WITNESS: That is one of the ranges that
6 Yang discloses.

7 BY MS. GORDON:

8 Q Right. But you highlighted that range,
9 correct, with both bold and italics; correct?

10 A Correct.

11 Q And why did you highlight that range?

12 MR. ODA: Objection; form.

13 THE WITNESS: That range is the minimum to the
14 maximum.

15 BY MS. GORDON:

16 Q And so that is the range from Yang that you're
17 applying in the combination of Teigen 683, Grey and
18 Yang?

19 MR. ODA: Objection; form, asked and answered.

20 THE WITNESS: That -- that is the range that
21 Yang has disclosed.

22 BY MS. GORDON:

23 Q Right. That wasn't my question.

24 I'm trying to understand your opinion in this
25 paragraph, and you have intentionally highlighted this

1 range, both in bold and in italics, so I want to
2 understand specifically why you selected this range to
3 highlight in bold and italics and not any of the other
4 ranges in this paragraph.

5 MR. ODA: Objection; form, asked and answered.

6 THE WITNESS: Because this covers the entire
7 range from minimum to maximum.

8 BY MS. GORDON:

9 Q All right. And so that is the range that you
10 are using in your analysis of how the combination meets
11 the limitations of claim 15; is that correct?

12 MR. ODA: Objection; form, asked and answered.

13 THE WITNESS: Yes.

14 BY MS. GORDON:

15 Q Okay. In paragraph 286 of your declaration --
16 Turn to that and let me know when you're
17 ready.

18 A I am there.

19 Q Okay.

20 -- you state (as read):

21 "...a POSA would recognize that
22 narrowing a range of inner catheter
23 diameters to meet the needs of a given
24 thrombectomy would be the result of
25 obvious, routine optimization."

1 What do you mean, in a statement, when you use
2 the term "routine optimization"?

3 A Well, it would mean optimizing the design of
4 the catheter to perform for the indication that it's
5 designed for.

6 Q Okay. And when you are referring to
7 optimizing the design, would that cover the factors we
8 discussed earlier in today's deposition?

9 MR. ODA: Objection; form.

10 THE WITNESS: It would.

11 BY MS. GORDON:

12 Q Okay. All right. All right.

13 All right. So I'd like to turn your attention
14 back to paragraph 281.

15 A Okay.

16 Q Okay. And in the sentence that -- or in the
17 portion of paragraph 281 that precedes the block cite
18 from paragraph 68 of Yang, you have the statement (as
19 read):

20 "The catheter is operable connect to
21 'a controller for applying
22 intermittent vacuum to the lumen'
23 using combinations of vacuum pulses
24 and 'spaces of neutral pressure,'
25 higher negative pressure or lower

1 negative pressure."

2 And you cite to Figures 25A through C of Yang.
3 Do you see that?

4 A I do, yes.

5 Q Okay. So I'd like to turn to paragraphs 168
6 through 170 of Yang that discusses Figures 25A through
7 C, and if it's possible for you to have Figures 25A
8 through C out next to those paragraphs, that would be
9 great.

10 Let me know when you're ready.

11 A Okay. I have 25A through C.

12 And you said to put it next to what?

13 Q Page 13 of Yang, which has paragraphs 168
14 through 170, which references these figures.

15 A Okay. I am there.

16 Q Okay. So let's start with Figure 25A, which
17 is at the top, and paragraphs 169 and 170, which refer
18 to this figure.

19 In Figure 25A, what does number 2510 refer to?

20 A 2510 is the catheter.

21 Q Okay. And what does number 2518 refer to?

22 A A release line.

23 Q And what does number 2520 refer to?

24 A A vacuum line.

25 Q Okay. And what does number 2514 refer to?

1 A A release valve.

2 Q Okay. And what does number 2516 refer to?

3 A A vacuum valve.

4 Q In Figure 25A, is the release line 2518
5 connected to atmospheric pressure and catheter 2510?

6 A Well, it says that it is connected to
7 atmosphere and to valve -- release valve 2514.

8 Q Right. And in Figure 25A that's described in
9 paragraph 170, is the release line 2518 connected to
10 atmospheric pressure and the catheter 2510?

11 A I'm sorry, you went to an area that I didn't
12 follow you.

13 Q Okay. So -- okay. Looking at Figure 25A.

14 A Yes.

15 Q Okay. Let me step back.

16 Is the release valve 2514 that we see in 25A
17 configured to open and close the fluid communication
18 between catheter 2510 and the atmosphere?

19 MR. ODA: Objection; form.

20 THE WITNESS: It appears you're -- you're
21 reading from somewhere. It would be helpful if I know
22 where you're reading from.

23 BY MS. GORDON:

24 Q Okay. So I'm referring to -- if you can focus
25 on paragraph 170.

1 A Yes.

2 Q Okay. So in paragraph 170, it says (as read):
3 "In the first step as shown in
4 Figure 25A, the release valve 2514 is
5 closed, and the vacuum valve is open
6 such that the vacuum is applied to the
7 catheter to aspirate the clot."

8 A Yes.

9 Q Okay. So in Figure 25A, is the release line
10 2518 connected to atmospheric pressure and the catheter
11 2510?

12 MR. ODA: Objection; form.

13 THE WITNESS: Well, yes, as we said, through
14 valve 2514.

15 BY MS. GORDON:

16 Q Okay. Okay. And is the release valve 2514
17 configured to open and close the fluid communication
18 between catheter 2510 and the atmosphere?

19 MR. ODA: Same objection.

20 THE WITNESS: Again, are you reading from
21 somewhere specific?

22 BY MS. GORDON:

23 Q Right. So reading from paragraphs 169 and
24 170 --

25 A Yes.

1 Q -- of Yang and looking at Figures 25A through
2 C.

3 A Right. But you asked me a specific question.

4 Q Right. So I'm asking, based on the
5 disclosures of Yang in those paragraphs and Figures 25A
6 through C, is release valve 2514 configured to open and
7 close the fluid communication between catheter 2510 and
8 the atmosphere?

9 MR. ODA: Objection; form.

10 THE WITNESS: Yes, it appears that that would
11 open and close the communication between the atmosphere
12 and the catheter.

13 BY MS. GORDON:

14 Q Okay. And is vacuum valve 2516 configured to
15 open and close the fluid communication between the
16 catheter 2510 and the vacuum?

17 MR. ODA: Same objection.

18 THE WITNESS: It does appear to be, yes.

19 BY MS. GORDON:

20 Q Okay. And in Figure 25A, when release valve
21 2514 is closed and the vacuum valve 2516 is open, is
22 vacuum applied to catheter 2510 to aspirate the clot?

23 MR. ODA: Objection; form.

24 THE WITNESS: What I'm looking for is whether
25 it mentions anything about -- yes, it does mention

1 aspirating the clot.

2 So, yes.

3 BY MS. GORDON:

4 Q Okay. And at this stage, shown in Figure 25A,
5 is the flow through the catheter moving towards vacuum
6 2520?

7 MR. ODA: Objection; form.

8 THE WITNESS: You asked is the fluid moving.

9 BY MS. GORDON:

10 Q Is the flow of fluid through the catheter
11 moving towards the vacuum 2520?

12 MR. ODA: Same objection.

13 THE WITNESS: It is difficult to tell if
14 that's the direction the fluid is moving.

15 BY MS. GORDON:

16 Q All right. So in this stage, you have vacuum
17 applied; correct?

18 MR. ODA: Objection; form.

19 THE WITNESS: Vacuum applied to the catheter,
20 yes.

21 BY MS. GORDON:

22 Q Okay. And the release valve is closed;
23 correct?

24 A Correct.

25 Q Okay. And why is it difficult to tell whether

1 the flow is towards the vacuum when the release valve
2 is closed and the vacuum valve is open?

3 MR. ODA: Objection; form.

4 THE WITNESS: Because it doesn't say -- or it
5 doesn't show in Figure 25A the point in time.

6 BY MS. GORDON:

7 Q Okay. So at some point in time after the
8 vacuum -- all right. Let's strike that.

9 If vacuum is applied to catheter 2510, in
10 Figure 25A, how can flow not go to vacuum 2520?

11 MR. ODA: Objection; form, incomplete
12 hypothetical.

13 THE WITNESS: If it's at time 0, it takes time
14 for the fluid to move, start moving.

15 If the fluid was previously moving into the
16 catheter, it would take time to change direction.

17 And if the catheter were corked, there would
18 be no flow.

19 BY MS. GORDON:

20 Q Okay. All right. So if you had the
21 circumstance where the catheter was not corked and a
22 time after vacuum valve 2514 is open, does flow move to
23 the vacuum 2520 -- I mean -- sorry, let me strike that
24 and ask again.

25 If the catheter is not corked and vacuum valve

1 2516 is open, does the fluid flow move to -- in the
2 direction to the vacuum?

3 MR. ODA: Objection; form, incomplete
4 hypothetical.

5 THE WITNESS: If valve 2516 is open and there
6 is vacuum applied and the catheter is not coked and
7 fluid is able to move freely, it would move towards
8 vacuum 2520.

9 BY MS. GORDON:

10 Q Okay. So let's turn to Figure 25B.

11 And in Figure 25B, has the release valve 2514
12 been opened while the vacuum valve 2516 stays open?

13 MR. ODA: Objection; form.

14 THE WITNESS: That appears to be the
15 situation.

16 BY MS. GORDON:

17 Q Okay. So at this point in time, release valve
18 2518 is connected to atmosphere and the vacuum line is
19 connected to the vacuum; is that correct?

20 A I'm going to have you repeat what you asked.

21 Q Right. Okay. So in Figure 25B, release line
22 2518 is connected to atmosphere, and vacuum line is
23 connected to the vacuum -- wait, sorry, let me strike
24 that and ask it again.

25 So in Figure 25B, release line -- let me

1 strike -- let me start again.

2 In Figure 25B, are the release line 2518
3 connected to atmosphere and the vacuum line connected
4 to the vacuum 2520 in fluid communication?

5 MR. ODA: Objection; form.

6 THE WITNESS: So they are connected through
7 this diagram. We've never defined fluid communication,
8 but if you're referring to are they both connected to
9 the same fluid, which would be the fluid that would be
10 within this system, yes, they are connected.

11 BY MS. GORDON:

12 Q Okay. Okay. And when this occurs, as shown
13 in Figure 25B, does Yang teach that when the release
14 line 2518 and the vacuum line 2520 are in fluid
15 communication, this would result in dropping the vacuum
16 to the catheter?

17 MR. ODA: Objection; form.

18 THE WITNESS: He may.

19 Can you point me to where you're reading from?

20 BY MS. GORDON:

21 Q Yeah. If you look in paragraph -- I believe
22 it's 171. Hold on. Let me just get you the precise
23 language.

24 Okay. It's actually in paragraph 170, and it
25 is -- you see it says (as read):

1 "Then, as shown in Figure 25B, the
2 release valve 2514 is opened while the
3 vacuum valve 2516 stays open. Because
4 the release line 2518 and the vacuum
5 line 2520 are in fluid communication,
6 either directly or via at least a
7 portion of the catheter 2510, the
8 vacuum is applied mainly through the
9 release line 2518, dropping vacuum
10 applied to the catheter."

11 Do you see that?

12 A I do.

13 Q Okay. So you would agree that Yang teaches
14 that when the release line 2518 and the vacuum line
15 2520 are in fluid communications, this results in
16 dropping the vacuum to the catheter?

17 MR. ODA: Objection; form.

18 THE WITNESS: Yes.

19 MR. ODA: Argumentative.

20 BY MS. GORDON:

21 Q Okay. And at this stage of the process, in
22 Yang would you expect the flow through the catheter to
23 be towards vacuum 2520 if the catheter is not corked?

24 MR. ODA: Objection; form, incomplete
25 hypothetical.

1 THE WITNESS: Possibly. It just simply says,
2 "dropping vacuum applied to the catheter." It does not
3 say how much or to what degree.

4 BY MS. GORDON:

5 Q Okay. My question was, would you expect the
6 flow through the catheter to be towards the vacuum 2520
7 in this stage of the process if the catheter is not
8 corked?

9 MR. ODA: Same objection.

10 THE WITNESS: And my answer remains the same.

11 BY MS. GORDON:

12 Q Right. So what factors influence the
13 direction of the flow?

14 MR. ODA: Objection; form.

15 THE WITNESS: Flow is influenced by pressure.

16 BY MS. GORDON:

17 Q Okay. Are there any other factors that
18 influence the direction of the flow?

19 MR. ODA: Objection; form.

20 THE WITNESS: Primarily pressure.

21 BY MS. GORDON:

22 Q Okay. And how does pressure influence the
23 direction of the flow?

24 MR. ODA: Objection; form.

25 THE WITNESS: Pressure would push the fluid

1 one direction or the -- or another.

2 BY MS. GORDON:

3 Q Okay. If there is negative pressure in
4 Figure 25B, would the flow go towards the vacuum?

5 MR. ODA: Objection; form, incomplete
6 hypothetical.

7 THE WITNESS: If there was negative pressure
8 where?

9 BY MS. GORDON:

10 Q In the catheter.

11 A Okay. Then re-ask your question, please.

12 Q Okay. If there's negative pressure in the
13 catheter, in Figure 25B, and the catheter is not
14 coked, would flow go to the vacuum?

15 MR. ODA: Same objection.

16 THE WITNESS: If there's negative pressure in
17 the catheter, I would need to know the pressures
18 elsewhere to give you the direction of flow.

19 BY MS. GORDON:

20 Q Okay. Where else would you need to know the
21 pressures to give the direction of flow?

22 MR. ODA: Objection; form.

23 THE WITNESS: Everywhere within this diagram.

24 BY MS. GORDON:

25 Q Okay. So in this diagram, Figure 25B, we know

1 that vacuum is being applied; correct?

2 MR. ODA: Objection; form.

3 THE WITNESS: Vacuum is being applied through
4 2520.

5 BY MS. GORDON:

6 Q Okay. And in my question, there is negative
7 pressure in the catheter; correct?

8 MR. ODA: Objection; form.

9 THE WITNESS: Per your question, correct.

10 BY MS. GORDON:

11 Q Okay. And the catheter is uncorked, per my
12 question; correct?

13 A Correct.

14 Q Okay. What other pressure is relevant to
15 determine direction of flow in the example in my
16 question?

17 MR. ODA: Objection; form, asked and answered.

18 THE WITNESS: You are telling me there's
19 negative pressure in the catheter.

20 BY MS. GORDON:

21 Q Correct.

22 A You haven't told me how much negative pressure
23 there is in the catheter, nor have you told me
24 pressures in other -- any other area of this system;
25 therefore, it is impossible for me to tell you

1 direction of flow.

2 Q Okay. So if this catheter is being used in
3 the body as described in the applications in Yang,
4 there would be body pressure at the distal end and
5 atmospheric pressure in line 2518; correct?

6 MR. ODA: Objection; form, incomplete
7 hypothetical.

8 THE WITNESS: Correct.

9 BY MS. GORDON:

10 Q Okay. So if we have body pressure at the
11 distal end of the catheter, there is negative pressure
12 in the catheter, and we have atmospheric pressure in
13 line 2518, would the flow go to the vacuum?

14 MR. ODA: Same objection.

15 THE WITNESS: As long as the vacuum 2520 is
16 less than the vacuum you are describing in the
17 catheter. If -- if it is, then the flow would move
18 from the catheter towards vacuum 2520.

19 BY MS. GORDON:

20 Q Okay. So if the vacuum pressure in 2520 was
21 negative 25 inches of mercury, in the example of my
22 question, would the flow move towards the vacuum?

23 MR. ODA: Same objection.

24 THE WITNESS: If that vacuum is less than the
25 vacuum you told me that's in the catheter.

1 BY MS. GORDON:

2 Q Okay. Okay. So -- okay.

3 So let's turn now to Figure 25C, and in
4 Figure 25C, the vacuum valve has been closed and the
5 release valve remains open.

6 Do you see that?

7 A I do.

8 Q Okay. So when the vacuum valve 2516 has been
9 closed, while the release valve 2514 stays open, does
10 Yang teach that the vacuum has been completely
11 released?

12 MR. ODA: Objection; form.

13 THE WITNESS: Again, if you're reading from
14 some specific area, if you can point to that.

15 BY MS. GORDON:

16 Q All right. So if we point you to paragraph
17 170 of Yang, in the end of that paragraph, he states
18 (as read):

19 "Finally, as shown in Figure 25C, the
20 vacuum valve 2516 is shut off,
21 allowing the vacuum to be completely
22 released and the clot to relax."

23 Do you see that?

24 A I do.

25 Q Okay. And so you would agree, then, that Yang

1 teaches that the vacuum has been completely released
2 when the vacuum valve 2516 has been closed, while the
3 release valve 2514 stays open, as shown in Figure 25C?

4 MR. ODA: Objection; form, argumentative.

5 THE WITNESS: I do agree that that is what
6 Yang is teaching.

7 BY MS. GORDON:

8 Q Okay. And does Yang also teach, in this
9 paragraph, that completely releasing the vacuum causes
10 the clot to relax?

11 MR. ODA: Objection; form.

12 THE WITNESS: He is saying that the clot
13 relaxes when the vacuum is completely released.

14 BY MS. GORDON:

15 Q Okay. And in the last sentence of
16 paragraph 170, does Yang teach that another cycle from
17 Figure 25A through 25C begins after the first cycle is
18 completed?

19 A So it says it begins by closing release valve
20 2514 and opening vacuum valve 2516.

21 Q Right. And Yang states, in that sentence,
22 another cycle from 25A to 25C begins; correct?

23 A Correct.

24 Q Okay. So based on the teachings of Yang, in
25 paragraphs 169 and 170, and Figures 25A through C, in

1 your opinion, does opening and closing the release
2 valve 2514 and the vacuum valve 2516, during the
3 pulsatile cycle shown in Figures 25A through 25C and
4 described in paragraphs 169 and 170, control flow
5 through the catheter 2510?

6 MR. ODA: Objection; form.

7 THE WITNESS: Yes.

8 BY MS. GORDON:

9 Q Okay. And since Yang controls flow through
10 the catheter 2510 and blood is an incompressible fluid,
11 as we discussed earlier here today, does it follow that
12 Yang controls flow out from the distal end of the
13 catheter?

14 MR. ODA: Objection; form.

15 THE WITNESS: That's an unknown.

16 BY MS. GORDON:

17 Q Okay. And why is that an unknown?

18 MR. ODA: Same objection.

19 THE WITNESS: Because he does not disclose
20 here whether he is or is not controlling flow, as you
21 described.

22 BY MS. GORDON:

23 Q Can you help me understand your answer here?

24 I believe, when I asked you the question
25 earlier, you agreed that Yang discloses control of flow

1 through catheter 2510, in paragraphs 169 and 170 and
2 Figures 25A through C; correct?

3 A That is correct.

4 Q Okay. And in the answer to the prior question
5 that I asked you, you said, "he does not disclose here
6 whether he is or is not controlling flow, as you
7 described."

8 What do you mean by that answer?

9 A I answered your specific question.

10 Q Okay. So my question was, we agree that Yang
11 controls flow through catheter 2510; correct?

12 A Correct.

13 Q And we agree that blood is an incompressible
14 fluid; correct?

15 A Correct.

16 Q All right. So does it follow, then, that Yang
17 controls flow out from the distal end of the catheter?

18 MR. ODA: Objection; form.

19 THE WITNESS: And I answered that.

20 BY MS. GORDON:

21 Q And can you answer it again because I ask it
22 again.

23 A I said that's --

24 MR. ODA: Objection; form, asked and answered.

25 THE WITNESS: -- that's an unknown.

1 BY MS. GORDON:

2 Q And why is it an unknown?

3 MR. ODA: Objection; form.

4 THE WITNESS: Because he has not described
5 the -- the level of detail that you're asking.

6 BY MS. GORDON:

7 Q So in your opinion, does Yang disclose control
8 of flow into the distal end of the catheter?

9 MR. ODA: Objection; form.

10 THE WITNESS: Yes, he describes aspiration,
11 and so, yes, he is describing flow into the catheter.

12 BY MS. GORDON:

13 Q Okay. And so does Yang disclose control of
14 flow out from the distal end of the catheter?

15 MR. ODA: Objection; form, asked and answered.

16 THE WITNESS: That's an unknown.

17 BY MS. GORDON:

18 Q And why is it unknown?

19 MR. ODA: Objection; form, asked and answered.

20 MS. GORDON: And I'll continue asking it until
21 I get an answer.

22 BY MS. GORDON:

23 Q So can you tell me why that is an unknown?

24 A Because he does not describe the flow out and
25 whether his system controls flow out.

1 And when we say "out," I'm assuming you mean
2 in the distal direction.

3 Q Correct. In the distal direction, out of the
4 catheter.

5 MR. ODA: Objection; not a question.

6 MS. GORDON: Okay. So I think we've been
7 going for over an hour. I think if we could take a
8 break now, maybe a little longer break, because we may
9 not have any further questions for you, Mr. Brown.

10 THE WITNESS: Okay. What time would you like
11 to meet?

12 MS. GORDON: Why don't we jump on the bridge
13 at half past the hour, and if we're not finished -- if
14 I'm not finished conferring internally, I'll leave a
15 message there to let -- let you know we need more time,
16 but I think that should be sufficient.

17 THE WITNESS: Okay. And that would be on the
18 chat?

19 MS. GORDON: Yeah. So in the message box
20 here. Yeah, if -- if you come back at 12:30 and
21 there's a message from Paul and I that we need more
22 time, it will be in that chat box.

23 THE WITNESS: Very good.

24 MS. GORDON: All right. Thanks.

25 (Recess.)

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MS. GORDON: Mr. Brown, we have no further questions for you here today. I want to thank you for your time.

THE WITNESS: Very good.

MR. ODA: Petitioner has no redirect.

MS. GORDON: Thank you.

(TIME NOTED: 12:19 p.m.)

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I, BRIAN BROWN, do hereby declare under penalty of perjury that I have read the foregoing transcript; that I have made any corrections as appear noted, in ink, initialed by me, or attached hereto; that my testimony as contained herein, as corrected, is true and correct.

EXECUTED this _____ day of _____,
20____, at _____, _____.
(City) (State)

BRIAN BROWN
Volume I

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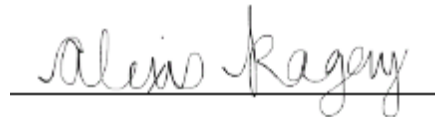
I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: December 22, 2022

A handwritten signature in cursive script, reading "Alexis Kagay", written over a horizontal line.

ALEXIS KAGAY

CSR NO. 13795

1 BRIAN BROWN

2 BB.Browntech@gmail.com

3 December 22, 2022

4 RE: PENUMBRA, INC. vs. RAPIDPULSE, INC.

5 December 9, 2022, BRIAN BROWN, JOB NO. 5618487

6 The above-referenced transcript has been
7 completed by Veritext Legal Solutions and
8 review of the transcript is being handled as follows:

9 ___ Per CA State Code (CCP 2025.520 (a)-(e)) - Contact Veritext
10 to schedule a time to review the original transcript at
11 a Veritext office.

12 _X_ Per CA State Code (CCP 2025.520 (a)-(e)) - Locked .PDF
13 Transcript - The witness should review the transcript and
14 make any necessary corrections on the errata pages included
15 below, notating the page and line number of the corrections.
16 The witness should then sign and date the errata and penalty
17 of perjury pages and return the completed pages to all
18 appearing counsel within the period of time determined at
19 the deposition or provided by the Code of Civil Procedure.

20 ___ Waiving the CA Code of Civil Procedure per Stipulation of
21 Counsel - Original transcript to be released for signature
22 as determined at the deposition.

23 ___ Signature Waived - Reading & Signature was waived at the
24 time of the deposition.

25

Page 98

1 ___ Federal R&S Requested (FRCP 30(e)(1)(B)) - Locked .PDF
2 Transcript - The witness should review the transcript and
3 make any necessary corrections on the errata pages included
4 below, notating the page and line number of the corrections.
5 The witness should then sign and date the errata and penalty
6 of perjury pages and return the completed pages to all
7 appearing counsel within the period of time determined at
8 the deposition or provided by the Federal Rules.
9 ___ Federal R&S Not Requested - Reading & Signature was not
10 requested before the completion of the deposition.

1 CASE: PENUMBRA, INC. vs. RAPIDPULSE, INC.
2 WITNESS: BRIAN BROWN (#JOB NO 5618487)
3 E R R A T A S H E E T
4 PAGE_____ LINE_____ CHANGE_____
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24 WITNESS _____ Date _____
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[& - 6]

&	11776 97:22	2022 1:17 2:17	77:13,16 78:4,9
& 98:23 99:9	12 12:13 18:5	6:1 15:22 97:19	79:1,5,20 80:4
0	31:5 47:3 48:13	98:3,5	81:5,10 90:17,22
0 81:13	48:17,20 49:6,19	2025.520 98:9,12	90:25 91:3 92:2
0.030 66:21	50:1	209 10:23	25b 82:10,11,21
72:22	12:19 95:7	22 97:19 98:3	82:25 83:2,13
0.070 67:14	12:29 2:17	24 48:2	84:1 86:4,13,25
0.072 67:15	12:30 94:20	25 65:2 88:21	25c 89:3,4,19
0.112 66:21	13 76:13	2510 76:19,20	90:3,17,22 91:3
72:23	13795 1:23 2:18	77:5,10,18 78:11	27 39:5
1	97:23	78:18 79:7,16,22	277 51:8,22 58:4
1 1:25 10:1,7,17	15 12:14 24:4	81:9 84:7 91:5	70:24
12:23 99:1	74:11	91:10 92:1,11	281 72:18 75:14
10 24:4 33:21	16 19:18,19,19	2514 76:25 77:7	75:17
48:11	168 76:5,13	77:16 78:4,14,16	286 64:8,11
10,531,883 7:4	169 14:23 76:17	79:6,21 81:22	74:15
10,722,253 1:8	78:23 90:25	82:11 84:2 89:9	2nd 15:22
2:8 6:22 9:12	91:4 92:1	90:3,20 91:2	3
100 1:25	170 76:6,14,17	2516 77:2 79:14	3 29:4 48:1,11
1001 3:7 10:3	77:9,25 78:2,24	79:21 82:1,5,12	30 99:1
1002 10:6	83:24 89:17	84:3 89:8,20	31 39:7
1003 10:8	90:16,25 91:4	90:2,20 91:2	3150 4:8
1004 10:10	92:1	2518 76:21 77:4	3600 3:18
1005 9:13 10:11	171 83:22	77:9 78:10	4
12:21	18 23:19,21 29:2	82:18,22 83:2,14	48 39:5
1006 10:13	29:5	84:4,9,14 88:5	5
1007 10:14 38:20	2	88:13	5 56:5,19
38:21	2 10:9,19 31:5	2520 76:23 80:6	51 20:18 29:18
1008 10:16	39:4 48:11 56:4	80:11 81:10,23	33:23
1009 10:18	20 96:11	82:8 83:4,14	5618487 1:24
101 3:17	200 3:8	84:5,15,23 85:6	98:5 100:2
1010 10:21,21,23	2017/0238953	87:4 88:15,18,20	574 10:20
1011 10:20	58:6	253 6:25 7:6	6
1012 10:25 58:7	2020 13:7,8,17	10:4 13:10 14:5	6 5:6 46:13,15,17
1013 11:1	13:24	14:9 18:19,21	46:23 56:5
11,197,683 38:20	2021 14:7,8	19:1,9,17	
		25a 76:2,6,7,11	
		76:16,19 77:4,8	

[62 - arteriovenous]

<p>62 51:3</p> <p>67 58:21,23 59:4 61:11 62:16 63:25 64:4,6</p> <p>68 51:3 58:22,23 59:4,8,14 60:1 60:23 61:11,16 62:16,19 63:14 64:1,4,6 66:7 75:18</p> <p>683 10:15 18:22 39:24 71:7 73:3 73:17</p> <p>69 68:7</p>	<p>access 33:7 58:10</p> <p>accessible 58:9</p> <p>accessing 9:5</p> <p>accurate 8:7 35:7 97:11</p> <p>achieve 61:9</p> <p>action 97:14</p> <p>addition 11:9 19:19</p> <p>additional 27:7</p> <p>address 26:1</p> <p>adjust 53:8</p> <p>administered 6:5</p> <p>advancing 70:8</p> <p>affect 31:25 32:1 65:24 68:14,21 68:22 69:3,3,8</p> <p>age 35:21</p> <p>ago 6:15</p> <p>agree 16:19 19:25 84:13 89:25 90:5 92:10,13</p> <p>agreed 10:4 15:8 91:25</p> <p>airways 22:20</p> <p>alexis 1:22 2:18 97:22</p> <p>allowing 89:21</p> <p>alto 3:9 4:9</p> <p>amount 42:12</p> <p>analysis 74:10</p> <p>angioplasty 55:2</p> <p>answer 35:4 36:15,18 40:11 41:9 44:4,9 47:7</p>	<p>49:25 53:20 57:23 61:21 85:10 91:23 92:4,8,21 93:21</p> <p>answered 18:2 41:13 64:5 73:19 74:5,12 87:17 92:9,19,24 93:15,19</p> <p>answers 14:20</p> <p>anticipating 18:23</p> <p>anybody 11:10</p> <p>aorta 64:25</p> <p>appeal 1:2 2:2</p> <p>appear 70:22 79:18 96:6</p> <p>appearances 3:1 4:1</p> <p>appearing 2:16 98:18 99:7</p> <p>appears 77:20 79:10 82:14</p> <p>application 24:13,14 38:10 47:7,17,20,21 48:15 52:11 53:1 56:1,19 60:10,23 61:14 63:8,15 67:16,23 68:3</p> <p>applications 26:8 43:8,12,15 44:12 52:8 54:25 55:7,22 58:20 59:7,11,16 59:25 60:20 62:10,14 66:25</p>	<p>67:11 88:3</p> <p>applied 15:10 66:15 67:1,3 78:6 79:22 80:17,19 81:9 82:6 84:8,10 85:2 87:1,3</p> <p>apply 35:20 60:16</p> <p>applying 73:17 75:21</p> <p>appropriate 49:13</p> <p>approve 16:20</p> <p>approved 16:23 17:9</p> <p>approximately 12:3,6,11,13 19:15,18</p> <p>area 29:14 65:8 77:11 87:24 89:14</p> <p>arguing 20:15</p> <p>argumentative 20:12 32:15 84:19 90:4</p> <p>arguments 20:14</p> <p>art 52:9 60:19 62:17 64:17 71:6</p> <p>arterial 27:20 28:8 33:6</p> <p>arteries 21:3 22:20 27:16 28:17</p> <p>arteriovenous 33:3,18</p>
7			
72 51:3			
8			
<p>8 33:20 48:11</p> <p>833 11:1</p> <p>883 13:9,20,25 14:16 19:2,10,20 20:2</p>			
9			
<p>9 1:17 2:17 6:1 98:5</p> <p>94111 3:19</p> <p>94304 3:9 4:9</p> <p>953 10:25 61:24</p> <p>9:37 2:16 6:2</p>			
a			
<p>a.m. 2:16 6:2</p> <p>ability 53:8</p> <p>able 28:5 44:23 49:15 62:4 82:7</p> <p>abstract 70:7</p>			

[artery - ca]

artery 30:4,18 asked 14:4,9 18:2 41:13 64:5 73:19 74:5,12 79:3 80:8 82:20 87:17 91:24 92:5,24 93:15,19 asking 31:11 39:22,24 79:4 93:5,20 aspects 55:5 aspirate 48:25 49:15 57:20,22 78:7 79:22 aspirated 36:25 37:1 aspirating 80:1 aspiration 28:22 29:8,11 31:1 33:17 34:25 36:4,7,13,16,17 36:21,23 37:2,13 37:17,24 38:10 39:8,11,13,14,20 39:23 40:4 41:3 47:4 48:14,21 50:13 52:5 93:10 associate 59:10 61:16 associated 6:21 7:3 30:17 31:12 61:18,20 assuming 94:1 atmosphere 77:7 77:18 78:18 79:8,11 82:18,22 83:3	atmospheric 77:5,10 78:10 88:5,12 attached 96:7 attended 11:24 attention 39:3 75:13 attorney 3:6 8:1 97:15 attorneys 3:16 4:7 audio 7:20 authorized 15:3 15:4,9,21 16:1,5 16:12 17:7,14,22 available 34:23 41:17,18,24 59:9 60:6 63:9 aware 8:8 38:13	46:3 57:9,12,17 63:12,17 66:24 79:4 90:24 basic 40:23 bb.browntech 98:2 beginning 2:16 begins 90:17,19 90:22 behalf 2:15 believe 11:17 13:7,18 14:6,11 17:5,16 23:18 24:3 26:22,25 28:25 33:20 35:4 38:24 44:5 45:10 54:21 55:21 58:13 59:14 65:19 70:17 83:21 91:24 beyond 70:11 bit 24:9 block 75:17 blockage 30:17 blocked 30:4 blood 28:4 33:7 37:10,12 64:19 64:21 65:1 91:10 92:13 board 1:2 2:2 bodily 37:4 body 21:15 23:10 28:5 33:12 43:19 44:16,18 88:3,4 88:10	bold 73:9 74:1,3 bottom 46:10 botts 3:4,13 11:14 13:19,24 14:19 15:12 16:13 box 94:19,22 brain 31:21 32:17 break 8:1,3 24:19 31:16 50:7,20,22 57:20 94:8,8 breaks 24:23 brian 1:16 2:14 5:3 6:4,12 9:11 96:4,15 98:1,5 100:2 bridge 94:12 broke 27:12 brought 26:9 brown 1:16 2:14 5:3 6:4,12,13 7:10 8:9 9:10,11 14:25 19:12 20:8 21:8 47:9 51:2 54:21 94:9 95:1 96:4,15 98:1,5 100:2 bulky 49:6,10 50:1
	b		c
	b 99:1 back 25:14 59:22 66:6 75:14 77:15 94:20 baker 3:4,13 11:14 13:19,24 14:19 15:12 16:13 bakerbotts.com 3:10,20,21 balloon 47:24 based 20:21 25:2 25:15,25 26:15 30:9,20 31:7 32:12 33:24 34:4 45:21,22,23		c 76:2,7,8,11 79:2,6 90:25 92:2 ca 98:9,12,20

[calculate - comparison]

<p>calculate 65:9</p> <p>california 3:9,17 3:19 4:9 97:4</p> <p>call 10:4</p> <p>called 29:19</p> <p>capillaries 23:18 24:3</p> <p>capillary 64:24</p> <p>case 13:19 21:2 21:3 27:25 31:9 37:8 100:1</p> <p>cases 40:12,14</p> <p>catheter 20:21 25:2,15,25 26:2 26:8,15 30:9,20 31:7 32:12 33:24 34:4,18 36:7,10,14,14,14 36:16,17,23 37:2 37:17 39:8,11,13 39:20,23 40:4 42:4,4,16,24 43:5,7,9,18,19 43:22,22 44:2 45:8,15,21,22,24 46:4,7,13,15,17 46:23 47:4,4,20 48:14,21 49:6,10 49:12 50:1,10 52:7,10,19 53:11 53:14,15,21,24 54:1,8,11 55:6 55:17,24,25 57:12,17,25 58:19 59:6,15,19 59:20,24 60:3,25 62:9,15 64:15 65:4,13,24,25</p>	<p>66:11,13 67:17 67:22 68:2,12,12 68:15,18 69:6,9 69:21 70:1,8,16 70:20,22,23 71:15 72:8,15 74:22 75:4,20 76:20 77:5,10,18 78:7,10,18 79:7 79:12,16,22 80:5 80:10,19 81:9,16 81:17,21,25 82:6 83:16 84:7,10,16 84:22,23 85:2,6 85:7 86:10,13,13 86:17 87:7,11,19 87:23 88:2,11,12 88:17,18,25 91:5 91:10,13 92:1,11 92:17 93:8,11,14 94:4</p> <p>catheters 34:8 34:11,21,22,25 35:1,2 36:4,13 39:14 41:24 44:6,12,16 45:20 47:10,12,14,16 47:24 48:2,5,8 50:13,15 51:3,11 51:14,20 52:5 54:9,23,25 55:2 55:3,4,4,18 56:9 56:21,24 57:3,9 60:14 64:18,21 67:4,4,5,5 69:14</p> <p>causes 90:9</p> <p>ccp 98:9,12</p>	<p>center 43:7</p> <p>cerebral 30:17 32:8</p> <p>certified 2:18 97:3</p> <p>certify 97:4,13</p> <p>change 70:1 81:16 100:4,7,10 100:13,16,19</p> <p>changed 44:12 57:5</p> <p>changes 17:12</p> <p>chat 94:18,22</p> <p>choose 49:12</p> <p>christian 3:15</p> <p>christian.mcfall 3:21</p> <p>circling 59:22</p> <p>circumference 45:22,23 46:3,4 46:18,20,21</p> <p>circumstance 81:21</p> <p>circumstances 69:19</p> <p>cite 58:5,21 75:17 76:2</p> <p>city 96:11</p> <p>civil 98:19,20</p> <p>claim 74:11</p> <p>claimed 64:15</p> <p>clean 11:6,7 38:22</p> <p>clear 7:19</p> <p>clinical 34:9 52:13</p> <p>clinician 34:17</p>	<p>clinicians 33:6</p> <p>close 77:17 78:17 79:7,11,15</p> <p>closed 78:5 79:21 80:22 81:2 89:4,9 90:2</p> <p>closing 90:19 91:1</p> <p>clot 78:7 79:22 80:1 89:22 90:10,12</p> <p>code 98:9,12,19 98:20</p> <p>coextensive 19:1</p> <p>coie 4:4</p> <p>column 39:4</p> <p>combination 72:25 73:17 74:10</p> <p>combinations 75:23</p> <p>combined 71:2,7 71:18,23,24</p> <p>combines 36:21</p> <p>combining 71:16</p> <p>come 94:20</p> <p>commonly 67:10</p> <p>communication 77:17 78:17 79:7,11,15 83:4 83:7,15 84:5</p> <p>communications 84:15</p> <p>compare 20:14</p> <p>compared 40:12</p> <p>comparison 19:6 40:18 69:9 70:1</p>
--	--	--	---

[completed - deep]

completed 90:18 98:7,17 99:6 completely 89:10,21 90:1,9 90:13 completion 99:10 complication 32:19,24 complications 32:17 composites 54:6 conclusion 58:22 58:24 59:5 60:1 67:8 condition 26:16 26:24 29:19 30:10 34:12 35:15 conditions 33:25 34:5 35:6,11,21 62:19 conferring 94:14 configured 77:17 78:17 79:6,14 confirm 16:4 confirmed 16:22 conjunction 19:14 connect 75:20 connected 13:18 77:5,6,9 78:10 82:18,19,22,23 83:3,3,6,8,10 connection 13:5 consider 18:10 32:10 40:4,5,7	40:24 47:3 considered 18:7 18:11,14 19:1,2 19:9,10 21:11 37:12,23 39:20 40:18 48:14,20 52:15 construction 53:24 consult 14:15 contact 98:9 contacted 13:16 13:23 contained 96:8 context 42:3 continue 69:1 93:20 continued 4:1 control 70:8 91:4,25 93:7,13 controller 75:21 controlling 91:20 92:6 controls 91:9,12 92:11,17 93:25 copies 11:3,6,7 12:17 copy 15:12,14,18 16:3,8 38:22 58:8 corked 81:17,21 81:25 82:6 84:23 85:8 86:14 coronary 30:4 47:24 55:2,3,22 55:25,25 56:8 57:8,11,16 67:4	67:23 correct 7:4,5,7 10:22 11:6,7 13:25 14:1 17:18 18:3 19:21,23 20:10 21:18 22:11 23:23 26:3,10,12 30:6,10,12 39:1 39:2,17,18 44:8 54:23,24 55:15 55:16 58:15,16 59:20 61:8 64:1 64:2 66:11,12 69:6,15,17 70:16 70:17,20 72:8,10 73:9,9,10 74:11 80:17,23,24 82:19 87:1,7,9 87:12,13,21 88:5 88:8 90:22,23 92:2,3,11,12,14 92:15 94:3 96:9 corrected 96:8 corrections 96:6 98:14,15 99:3,4 correctly 46:2 46:16 counsel 11:14 12:4 14:18 15:12 16:12 19:14 98:18,21 99:7 couple 54:12 course 18:21 44:13 53:9 cover 64:17 75:7	covers 74:6 create 49:14 creates 44:17 cross 65:8 csr 1:23 97:23 current 20:3 cv 10:13 cycle 90:16,17 90:22 91:3
			d
			date 15:24 16:4 97:16 98:16 99:5 100:24 dated 97:19 day 15:25 96:10 days 41:18 death 32:11,17 32:20 december 1:17 2:17 6:1 97:19 98:3,5 decide 34:17 declaration 6:19 8:15,16,18 9:6 9:11 13:1 14:5 14:23 17:3,25 18:19 19:12,16 19:20 20:1,2,9 51:8,23 59:22 60:11 62:6,7 64:1,9 70:25 71:13 72:20 74:15 declare 96:4 deep 21:2,8,10 21:11,14 22:23 23:1,2,6,11,15

[deep - discussion]

<p>24:12 25:3,9,16 25:22 26:1,16,25 28:22 29:1 33:25 35:14,19 48:21 60:22,25 61:6 define 21:8 22:7 29:20 30:14 39:24 defined 21:14 83:7 definition 33:4 degree 85:3 delivery 55:4 depend 49:2,22 depending 47:17 53:8 56:13 57:6 depends 34:12 35:21 47:6 48:24 deposed 7:3 deposition 1:15 2:14 6:17,24 7:17,25 8:10,21 9:9,18,23 11:11 11:16 12:1,5,12 12:15 39:1 58:15 75:8 98:19,22,24 99:8 99:10 describe 35:19 93:24 described 77:8 88:3 91:4,21 92:7 93:4 describes 70:15 93:10</p>	<p>describing 36:12 88:16 93:11 description 22:14,16 design 47:10,14 48:4 54:25 55:6 56:8 57:8,11,16 59:9 66:14 69:21 75:3,7 designed 47:12 47:16 54:23 55:2,18 60:15 75:5 designer 53:7 designing 52:15 55:24 designs 56:2 desire 71:2 detail 59:25 93:5 determine 65:12 87:15 determined 65:4 65:6 98:18,22 99:7 device 40:17 41:10 44:21 60:16,17 devices 40:17 41:12,16,16 42:6 deville 6:25 7:6 10:4,7,8 13:10 13:10 14:5 18:19,21 19:2,9 19:10,17,20 20:2 diagram 83:7 86:23,25 dialysis 33:2,5,7 33:18</p>	<p>diameter 23:19 23:22 24:4 29:2 33:21 40:6,8,17 40:25 41:10,12 41:19,21 42:2,3 42:4,5,7,7,12,13 42:19,20,23,23 43:3,3 44:5,11 44:18,21 45:4,4 45:7,7 50:14,14 50:16 52:10,16 52:19,25 53:3,4 55:6 56:5,5,8,11 56:14,16,18 57:6 57:19,22,24,24 60:9,25 61:7,8 61:13,17 64:16 64:25 65:2,7,7 65:20,24 66:2,3 66:10 68:20,22 68:23 69:3,4,12 69:20,24,24,25 70:2 diameters 52:5,7 56:24 58:19 59:6,9,11,24 60:5,15,20 61:18 62:9,15,18,24 63:6,10,13 71:15 72:6,9,14,16 74:23 differ 57:12,17 difference 23:6 24:11 25:4 36:3 36:6 45:3 differences 22:23 34:3</p>	<p>different 34:7,10 34:15,20 36:13 36:17,20 57:8 59:16 60:5,19,20 66:9 72:5,9,14 difficult 31:17 35:25 40:10 41:4 50:7 80:13 80:25 direction 80:14 81:16 82:2 85:13,18,23 86:1 86:18,21 87:15 88:1 94:2,3 97:10 directly 84:6 disclose 61:12 91:19 92:5 93:7 93:13 disclosed 59:15 59:19 71:3,8,19 71:20 72:4 73:21 discloses 70:7 72:5,7 73:6 91:25 disclosures 71:16,24 79:5 discuss 59:14 discussed 34:14 51:15 61:3 75:8 91:11 discusses 76:6 discussing 33:18 33:25 37:9 49:22 discussion 52:12</p>
---	---	--	--

[dissolve - familiar]

dissolve 36:10 distal 24:12,20 24:22 25:4,9,11 26:14,19,24 27:1 27:4,7 28:1,7,16 31:9,16,18 32:3 32:11 44:23 66:10 68:8,11 69:4 70:8 72:9 72:14 88:4,11 91:12 92:17 93:8,14 94:2,3 distally 24:24 27:13,15,18,20 28:11 70:11 document 6:25 10:12 15:1,7,16 15:25 16:6,14,19 16:22,23 17:2,9 17:13,14,18,21 17:22 38:22,25 58:10 documenting 17:25 documents 8:13 8:14,15,17,20 9:17 11:4,10 12:11 15:13 19:6 20:14 38:25 58:14 double 43:9,21 draft 19:12 drafted 19:14 drafting 19:20 drive 4:8 driven 53:10 dropping 83:15 84:9,16 85:2	dual 42:24 43:5 43:9,19,22 44:2 due 41:16 e e 16:4,9,9,12 17:25 98:9,12 99:1 100:3,3,3 earlier 7:2 14:20 16:17 18:12,14 20:13 26:22 28:25 36:18 44:4,8 53:5 54:22 55:15 58:13 75:8 91:11,25 early 41:17 easier 44:22 57:19 either 40:6 84:6 ekg 29:23,24,25 electronic 15:14 elevated 21:4 29:23 30:1 34:1 elevation 29:19 29:20 eliot 3:5 eliot.williams 3:10 emboli 23:2 28:2 embolic 22:9 embolism 21:4 22:8,9,24 23:2,7 24:13 25:6,8,11 26:23 27:2,9,11 29:7 34:1 embolisms 29:12	employee 97:14 engaged 13:8 14:14 enter 9:8 44:16 entered 58:7 entire 64:17,20 64:23 74:6 entry 44:17 equation 65:11 errata 98:14,16 99:3,5 especially 39:10 39:12,13 evolved 41:15,20 evolves 44:7 exact 20:15 56:24 exactly 14:6,11 49:7 50:2,3 examination 5:2 6:8 examined 6:5 example 26:3,24 46:13 47:19 52:17,24 53:24 60:22 62:25 87:15 88:21 exception 18:21 exclusive 35:19 72:7,13 excuse 60:13 executed 96:10 exhibit 8:18,19 8:24 9:1,13,21 10:3,6,8,10,11 10:13,14,16,18 12:21 38:20,21 58:7	exhibits 5:9 9:4 9:22,24 10:2 12:18,19 18:11 18:13,17,19,20 18:25 19:2,8 expect 84:22 85:5 experience 22:22 23:5,24 30:19 39:19 47:9 48:8 54:22 66:13,24 67:16 expert 13:2,19 explain 27:24 36:3 45:14 60:8 explaining 41:5 extended 70:10 extending 70:11 extremities 21:15 25:23 f face 32:1 fact 16:19,23 36:20 51:19 factor 42:22 factored 56:15 factors 42:11,18 45:3,5,6 49:3,22 52:15 54:4 55:14 61:4,12 75:7 85:12,17 fading 38:15 fair 32:20 fall 13:7,8,17,24 familiar 29:15 51:2,10,12,14,19
---	--	--	---

[far - going]

far 28:10 29:3 41:5 52:13 february 15:22 federal 99:1,8,9 fibrous 35:25 57:21 figure 70:18 76:16,18,19 77:4 77:8,13 78:4,9 79:20 80:4 81:5 81:10 82:10,11 82:21,25 83:2,13 84:1 86:4,13,25 89:3,4,19 90:3 90:17 figures 76:2,6,7 76:14 79:1,5 90:25 91:3 92:2 filed 14:16 finally 89:19 financially 97:13 finish 8:2 finished 64:10 94:13,14 firm 13:16,17 first 13:23 16:16 70:9 78:3 90:17 fit 56:12 64:18 64:21 flexible 44:21 flow 33:13 80:5 80:10 81:1,10,18 81:22 82:1 84:22 85:6,13,15 85:18,23 86:4,14 86:18,21 87:15 88:1,13,17,22 91:4,9,12,20,25	92:6,11,17 93:8 93:11,14,24,25 fluid 37:4,13,24 65:3,12 69:13,20 77:17 78:17 79:7,15 80:8,10 80:14 81:14,15 82:1,7 83:4,7,9,9 83:14 84:5,15 85:25 91:10 92:14 fluids 36:25 37:1 focus 77:24 focused 55:19 follow 77:12 91:11 92:16 follows 6:6 98:8 foregoing 96:5 97:5,7,11 foreign 33:12 form 13:11,14 14:2 15:6,23 16:7,15,25 17:10 17:19 18:2 19:4 19:22 20:4,11 21:13,23 22:3,12 22:18 23:8,16 24:8,15 25:7,19 26:17 27:21 28:9,18 29:13 30:5,11,22 31:20 31:24 32:5,14,22 33:10,19 34:6 35:5,9,10,13,16 35:18 36:5,19,24 37:3,7,14,19,25 38:7,10,11 39:21 40:9 41:1,13	42:8,14 43:10,23 44:14 45:9,16 46:14 47:15,22 48:9,16,23 49:4 49:11 51:4,13 52:20 53:17 54:3,10,19 55:8 55:20 56:3,10 57:4,13 59:12 60:2,12 61:2,15 61:22 62:21 63:16,21 64:5 65:5,14 66:16 67:2,9,18,24 68:4,13 69:7,16 69:22 71:9,22 72:11 73:4,12,19 74:5,12 75:9 77:19 78:12 79:9,23 80:7,18 81:3,11 82:3,13 83:5,17 84:17,24 85:14,19,24 86:5 86:22 87:2,8,17 88:6 89:12 90:4 90:11 91:6,14 92:18,24 93:3,9 93:15,19 formation 21:10 33:9 forming 18:8,15 forms 34:16 forth 62:6 97:6 forwarded 15:14 francisco 3:19 frcp 99:1 free 24:23 31:16	freely 82:7 freezes 7:20 french 45:15,20 46:7,13,15,23 47:3,25 48:1,2 48:11,11,13,17 48:20 49:6,19 50:1 fresh 35:23 57:18 friday 1:17 2:17 6:1 front 9:15 12:22 58:8,12 70:5,19 full 6:10 function 53:4 further 27:1 58:20 94:9 95:1 97:11,13
g			
general 50:15 56:20 generally 28:22 29:11 31:1 getting 18:23 give 8:7 29:15 47:19 52:24 86:18,21 given 9:13 74:23 gmail.com 98:2 go 7:16 24:3 44:23 50:22 52:25 67:13 81:10 86:4,14 88:13 going 7:18 9:3 35:18 47:25			

[going - indication]

50:9,17 53:9 82:20 94:7 good 6:10 50:19 50:21 94:23 95:4 gordon 4:5 5:6 6:9,14 11:21 13:12,15,22 14:3 15:11 16:2,10,21 17:4,11,23 18:4 19:7,24 20:7,17 21:16 22:1,6,15 22:21 23:4,13,20 24:5,10,18 25:1 25:13,24 26:7,13 26:21 27:6,14,23 28:14,20 29:6,17 30:7,13,24 31:6 31:13,22 32:2,6 32:18 33:1,15,22 34:19 35:3,12 36:2,11,22 37:5 37:11,16,22 38:2 38:8,18 40:1,13 41:2,8,22 42:10 42:17 43:1,14,20 44:3 45:1,13,18 46:5,11,19 47:2 47:8,13,18 48:3 48:12,19 49:1,8 49:17,24 50:11 50:17,23 51:1,6 51:16 52:23 53:19 54:7,20 55:13,23 56:6,17 57:1,7,14 59:17 60:7,21 61:10,19 62:1 63:2,19,24	64:7 65:10,16,22 66:5,19 67:6,12 67:21 68:1,6,16 68:24 69:11,18 70:3 71:11,25 72:17 73:2,7,15 73:22 74:8,14 75:11 77:23 78:15,22 79:13 79:19 80:3,9,15 80:21 81:6,19 82:9,16 83:11,20 84:20 85:4,11,16 85:21 86:2,9,19 86:24 87:5,10,20 88:9,19 89:1,15 90:7,14 91:8,16 91:22 92:20 93:1,6,12,17,20 93:22 94:6,12,19 94:24 95:1,6 gotten 41:20 graft 33:3,5,18 grafts 33:8,17 great 76:9 greatly 53:10 grey 10:23 71:7 73:3,17 ground 7:17 guess 51:9	hear 13:12 hearing 32:1 heart 48:1 55:4 help 91:23 helpful 77:21 helping 36:9 hereto 96:7 high 24:3 higher 75:25 highlight 72:22 73:11 74:3 highlighted 73:8 73:25 historically 40:16,19,21 41:6 41:10,11 history 44:13 hold 18:22 83:22 home 7:12 hour 50:18 94:7 94:13 hours 12:3,7,10 12:14 19:15,18 19:19 huh 35:4 72:3 human 43:19 64:18,21 hypothetical 25:20 26:18 35:17 37:20 38:12 43:11,24 62:22 81:12 82:4 84:25 86:6 88:7	ids 56:20 57:2 illustrates 70:19 image 70:21 impact 28:7 31:18,23 32:3 42:12,18 43:2 45:6 56:7 68:12 68:17 69:5,13,20 impacted 28:15 45:3 impossible 87:25 ims 13:18,24 inch 54:18 inches 66:21,21 67:14,15 72:22 72:23 88:21 include 21:24 22:2,19 37:6,10 37:10 43:12 included 21:20 21:22 32:16 98:14 99:3 includes 70:8 incomplete 25:20 26:18 35:16 37:19 38:11 43:10,24 62:21 81:11 82:3 84:24 86:5 88:6 incompressible 37:13,24 91:10 92:13 index 5:1 indicated 44:5 indication 30:1 41:7 61:17 62:24 75:4
	h 100:3 half 94:13 handled 98:8 hang 51:24 hanover 7:12	i	
		identical 20:10	

[indications - longer]

indications 55:21 60:4,6,16 63:1,5 indicative 30:3 67:17 industry 54:22 infarction 21:6 29:19,21 30:2 34:2 infinite 46:9 influence 42:23 85:12,18,22 influenced 85:15 information 18:7,10 64:3 infraction 21:5 infusing 36:10 initial 31:14 initialed 96:7 injury 44:18,19 ink 96:7 inner 42:3,7,12 42:19,19,23 43:2 45:4,7 50:14 56:15,18 57:6,24 59:9 60:5,8 61:13 62:18 63:9 65:7,20,23 66:2,10 68:20 69:4,24 71:15 72:5,9 74:22 insert 14:25 15:13 17:7 inserted 15:2,3,5 15:17,21 16:5 intentionally 73:25	inter 6:21 9:12 interested 97:14 intermittent 75:22 internal 52:4,6 52:10,16,19,25 53:3 55:6 56:8 56:11 58:19 59:6,23 60:25 62:8 64:15 internally 94:14 involved 23:6 ipr 13:6 14:15 14:16,21 19:2,9 19:10,13 ipr2022-00608 1:7 2:7 ischemic 21:6 30:14,16,20 31:1 31:8,19 32:12 34:2 48:14,18 52:18 issue 7:20 italics 73:9 74:1 74:3	know 6:16 7:22 8:1 9:22 14:11 51:25 59:1 60:19 63:17 64:9 74:16 76:10 77:21 86:17,20,25 94:15 known 52:6 58:18 59:5,23 60:24 62:8 63:13 64:16	length 40:6 65:4 65:8,13,21,25 level 41:17 93:5 limitations 74:11 line 39:5,5,7 76:22,24 77:4,9 78:9 82:18,21,22 82:25 83:2,3,14 83:14 84:4,5,9 84:14,14 88:5,13 98:15 99:4 100:4,7,10,13,16 100:19 link 7:20 liquid 38:6,10 list 8:18,19,23 9:1,4,22,24 18:16,18,20,25 19:1 listed 8:17,24 38:25 52:22 62:16,18 67:20 lists 59:8 little 24:9 50:18 94:8 living 28:19 llp 3:4,13 4:4 located 7:10 25:17 location 26:9 44:22 55:9,18 61:4 locked 98:12 99:1 long 18:23 38:6 88:15 longer 94:8
	j 6:12 jellylike 35:24 36:1 job 1:24 98:5 100:2 jump 94:12	l	
	k	language 83:23 large 20:9 28:3 39:8,10,13,14,20 39:23 40:4,6,6,7 40:17,18,24 41:6 41:10 47:4 48:2 48:14,21 62:25 63:14 larger 41:12,15 41:19 48:18 49:19 50:9,9 57:21 66:2,3 largest 65:1 law 3:6,16 4:7 lead 60:1 leading 22:20 leave 94:14 led 67:7 lee 11:22 leg 26:3,10,16 legal 98:7 legs 21:17,20 26:5	
	kagay 1:22 2:18 97:22 kind 40:19		

[look - never]

look 9:3 60:23 83:21 looked 52:19 55:5 looking 10:12 77:13 79:1,24 lori 4:5 6:14 lorigordon 4:10 loss 31:21 lower 21:15 25:23 26:3,10 75:25 lumen 42:24,24 43:7,9,9,19,22 43:22 44:1,2 54:8 64:15 75:22 lumens 43:5,6 45:11 53:6 lung 22:11,13,20 lungs 28:2,3,4 lytic 35:2 36:4,9 36:14 lytics 36:10	marked 38:21 markings 12:19 material 22:9 53:8,9,12 materials 18:14 18:18 53:14,16 53:18,21,23 54:5 mathematical 65:11 matteo 11:1 matter 14:15,21 maximum 73:14 74:7 mcfall 3:15 mean 15:5 27:1 38:4 40:15 46:9 53:22 71:12 75:1,3 81:23 92:8 94:1 meaning 53:18 means 39:24 45:20 50:8 mechanical 35:1 36:4,7,9,14,16 mechanism 28:10 36:21 meet 11:10,13,15 74:23 94:11 meeting 12:4 meetings 11:23 11:25 12:8,12 meets 74:10 mention 20:20 33:2 61:12 79:25 mentioned 14:19 20:13 26:25 29:18 36:18	45:6,10 53:5 54:21 55:14 62:19 mentions 39:8 67:14 79:25 mercury 88:21 message 94:15 94:19,21 met 11:14 metals 54:5 middle 14:7 52:2 migrates 27:15 27:18,20 migrating 27:13 migration 24:12 24:20,22 25:4,4 25:9,10,12 26:14 26:20,24 27:2,4 27:8 28:1,8,16 31:9,19 32:4,11 mill 3:7 millimeter 33:21 46:17 56:19 millimeters 23:19,21 24:4 29:2,4,5 31:5,5 56:4,5 65:2 minimum 73:13 74:7 minnesota 7:12 minute 58:25 months 6:15 morning 6:10 52:13 60:18 61:5 63:18 motivated 71:1 move 81:14,22 82:1,7,7 88:17	88:22 moves 24:23 moving 80:5,8 80:11,14 81:14 81:15 multilumen 44:2 multiple 43:6 muscles 28:13 28:15,19 31:25 myocardial 21:5 29:19,21 30:2 34:2
			n
			name 6:10,14 13:17 97:17 narrowing 74:22 native 33:11 necessary 98:14 99:3 need 8:1 50:9 57:21 58:25 86:17,20 94:15 94:21 needed 43:25 needs 74:23 negative 75:25 76:1 86:3,7,12 86:16 87:6,19,22 88:11,21 neither 97:13 neuro 51:3 54:9 neurovascular 30:17 54:11 67:4 neutral 75:24 never 83:7
m			
machine 97:9 mail 16:4,9,9,12 17:25 main 44:15 maintain 33:13 majority 20:9 manner 71:3,8 71:19,20 72:4 mark 3:14 50:17 mark's 18:24 mark.oda 3:20			

[new - okay]

new 35:22 non 69:21 normal 40:19 notating 98:15 99:4 noted 95:7 96:6 number 8:13,19 8:24 9:1,13 45:11 59:8 63:14 76:19,21 76:23,25 77:2 98:15 99:4 numerous 34:10 nutrients 28:13	43:10,17,23 44:14 45:9,16 46:1,8,14,24 47:5,11,15,22 48:9,16,23 49:4 49:11,20 50:5 51:4,13 52:20 53:2,17 54:3,10 54:17,19 55:8,20 56:3,10,22 57:4 57:13 59:12 60:2,12 61:2,15 61:22 62:21 63:16,21 64:5 65:5,14,18 66:1 66:16 67:2,9,18 67:24 68:4,13,19 69:7,16,22 71:9 71:22 72:11 73:1,4,12,19 74:5,12 75:9 77:19 78:12,19 79:9,17,23 80:7 80:12,18 81:3,11 82:3,13 83:5,17 84:17,19,24 85:9 85:14,19,24 86:5 86:15,22 87:2,8 87:17 88:6,14,23 89:12 90:4,11 91:6,14,18 92:18 92:24 93:3,9,15 93:19 94:5 95:5	occluding 28:12 occur 27:8 occurs 25:22 83:12 oda 3:14 11:20 13:11,12,14 14:2 15:6,23 16:7,15 16:25 17:10,19 18:2 19:4,22 20:4,11 21:13,23 22:3,12,18,25 23:8,16 24:1,8 24:15 25:7,19 26:4,11,17 27:3 27:10,21 28:9,18 28:24 29:13 30:5,11,22 31:3 31:10,20,24 32:5 32:14,22 33:10 33:19 34:6,24 35:9,16 36:5,19 37:3,7,14,19,25 38:5,11,14,16 39:21 40:9 41:1 41:13 42:8,14,21 43:4,10,17,23 44:14 45:9,16 46:1,8,14,24 47:5,11,15,22 48:9,16,23 49:4 49:11,20 50:5,21 51:4,13 52:20 53:2,17 54:3,10 54:17,19 55:8,20 56:3,10,22 57:4 57:13 59:12 60:2,12 61:2,15 61:22 62:21	63:16,21 64:5 65:5,14,18 66:1 66:16 67:2,9,18 67:24 68:4,13,19 69:7,16,22 71:9 71:22 72:11 73:1,4,12,19 74:5,12 75:9 77:19 78:12,19 79:9,17,23 80:7 80:12,18 81:3,11 82:3,13 83:5,17 84:17,19,24 85:9 85:14,19,24 86:5 86:15,22 87:2,8 87:17 88:6,14,23 89:12 90:4,11 91:6,14,18 92:18 92:24 93:3,9,15 93:19 94:5 95:5 office 1:1 2:1 6:20 98:11 oh 51:25 69:1 73:1 okay 6:24 7:13 8:14,20,23 9:17 9:24 10:5,21,24 11:3,6,9,15,19 11:22,25 12:10 12:17,21,21,24 13:15,23 14:8,13 15:4,20 16:3,11 17:24 18:5,18,18 19:8,15,25 20:18 20:20 21:11,17 21:19 22:2,7,11 22:16,22 23:5,14 23:21,24 24:6,11
o	65:5,14,18 66:1 66:16 67:2,9,18 67:24 68:4,13,19 69:7,16,22 71:9 71:22 72:11 73:1,4,12,19 74:5,12 75:9 77:19 78:12,19 79:9,17,23 80:7 80:12,18 81:3,11 82:3,13 83:5,17 84:17,24 85:9,14 85:19,24 86:5,15 86:22 87:2,8,17 88:6,14,23 89:12 90:4,11 91:6,14 91:18 92:18,24 93:3,9,15,19 94:5 objections 38:14 obvious 74:25 occasion 65:17 occlude 28:3		

[okay - particular]

25:2 26:8,14,22 27:7,15,24 28:7 28:21 29:7,18 30:3,8,14,19 31:7 32:19 33:8 33:16,23 34:20 35:4 36:3,23 37:1,6,12,17,23 38:3,24 39:7,12 39:16,19 40:7 41:9 42:2,6,11 42:18 43:2,8,15 44:4,11 45:2,14 45:14,19 46:6,12 46:22 47:3,9,14 47:19 48:4,13,13 48:20,20 49:2,9 50:17,23 51:7,17 52:17,24 53:12 53:16 54:2,8,14 54:21 55:5,14,17 55:24,24 56:7,18 57:2,8,11,23 58:2,4,10,12,13 58:17 59:10,18 59:22 63:3 64:8 64:11,12 65:3,11 65:17,23 66:6,8 66:13,24 67:7,7 67:13,13,22 68:2 68:7,17,25 69:4 69:19 70:4,6,18 70:24 71:12,18 72:18,21 74:15 74:19 75:6,12,15 75:16 76:5,11,15 76:16,21,25 77:2 77:13,13,15,24	78:2,9,16,16 79:14,20 80:4,22 80:25 81:7,20 82:10,17,21 83:12,12,24 84:13,21 85:5,17 85:22 86:3,11,12 86:20,25 87:6,11 87:14 88:2,10,20 89:2,2,2,8,25 90:8,15,24 91:9 91:17 92:4,10 93:13 94:6,10,17 older 35:24 ones 8:19 18:12 18:16 32:9 67:20 open 77:17 78:5 78:17 79:6,11,15 79:21 81:2,22 82:1,5,12 84:3 89:5,9 90:3 opened 82:12 84:2 opening 90:20 91:1 operable 75:20 opinion 18:15 33:9 39:23 40:3 64:20 71:5 73:24 91:1 93:7 opinions 14:5,9 18:9 62:6 optimization 74:25 75:2 optimize 52:19 60:24	optimized 52:7 52:10 58:19 59:6,24 60:9 62:9 optimizes 63:7 optimizing 52:25 75:3,7 options 59:9 order 57:22 ordinary 60:19 organized 49:6,9 50:1,4,6 57:21 organizes 35:24 organs 28:19 original 24:23 98:10,21 outer 42:4,5,7,13 42:20,23 43:3 45:4,7,23 46:3 46:20,21 50:14 50:16 53:4 68:21 69:12,20 69:23,24 70:2 outside 12:11 overlap 20:1,6 owner 1:9 2:9,15 4:3 6:16 oxygen 28:5,13	pages 1:25 98:14 98:17,17 99:3,6 99:6 palo 3:9 4:9 paper 12:17 paragraph 12:23 12:25 18:5,6 20:18,20,24 29:18 30:8 33:2 33:23 39:4,7 51:8,22,23 52:2 58:4,21 59:8,14 60:1,23 62:16,19 63:14,25 64:4,8 64:12 66:7,9 67:14 68:7 70:24 71:5 72:18 73:25 74:4,15 75:14,17 75:18 77:9,25 78:2 83:21,24 89:16,17 90:9,16 paragraphs 58:23 59:4 61:11 76:5,8,13 76:17 78:23 79:5 90:25 91:4 92:1 parker 4:6 partes 6:21 9:12 participants 2:15 particles 28:11 50:8 particular 13:20 40:16 41:9 52:8 52:11 58:20 59:7,11,24 60:9
		p	
		p.m. 2:17 95:7 page 3:7 9:25 10:1 14:23 70:5 70:19 76:13 98:15 99:4 100:4,7,10,13,16 100:19	

[particular - provisional]

61:13 62:10 63:7,15 particularly 39:4 parties 97:15 party 17:7 passageway 33:5 patency 33:14 patent 1:1,2,7,9 2:1,2,7,9,15 4:3 6:16,20,21 7:4,6 7:7 9:12 10:3,15 13:10,10,21,25 14:5,9,16 18:20 18:21 38:20 39:25 58:5 59:15,21 70:19 patents 51:15,18 patient 32:10,19 49:14 paul 4:6 94:21 paulparker 4:11 pdf 98:12 99:1 pelvic 21:24 26:6 penalty 96:4 98:16 99:5 pending 8:2 penumbra 1:5 2:5 3:3,12 11:18 11:22 13:3,4,9 14:4,14,18 51:20 98:4 100:1 penumbra's 51:2,10 perform 44:1 75:4 performance 53:10	performing 26:15 period 98:18 99:7 peripheral 67:4 68:3 perjury 96:5 98:17 99:6 perkins 4:4 perkinscoie.com 4:10,11 person 52:9 60:18 62:17 71:6 petition 9:11 petitioner 1:6 2:6 3:3,12 95:5 physically 7:10 pi 65:19 pick 61:7 62:24 place 97:6 placed 17:21 97:8 plastics 54:6 platform 7:20 please 7:21 8:23 9:10,21 24:17 45:19 59:1 86:11 point 44:17,17 62:4 63:23 81:5 81:7 82:17 83:19 89:14,16 pointed 63:25 points 20:16 polymers 53:25 porter 4:8	portion 39:16 68:11 75:17 84:7 portions 29:22 72:10 posa 52:6,18,25 58:18 59:5,23 60:24 62:8 63:10,12 64:14 71:1 74:21 position 6:15 70:9,11 possible 27:2,5 76:7 possibly 22:19 85:1 potential 31:23 practitioner 43:21 precedes 75:17 precise 8:20 83:22 preparation 8:21 9:18,23 11:16,23 39:1 58:15 prepare 8:9,12 11:10 12:1,4,12 12:14 13:9 prepared 13:1 preparing 13:5 19:16 present 4:14 14:15,21 pressure 75:24 75:25 76:1 77:5 77:10 78:10 85:15,20,22,25	86:3,7,12,16 87:7,14,19,22 88:4,5,10,11,12 88:20 pressures 86:17 86:21 87:24 pretty 43:18 previously 67:20 81:15 primarily 85:20 primary 18:12 22:13 prior 92:4 97:7 probably 6:15 29:4 64:25 procedure 29:24 29:24 31:12 40:16 41:10 44:1 98:19,20 procedures 40:21 41:11 proceed 8:3 proceeding 9:6 9:14 13:6 18:15 19:3,13,17 20:2 20:3 38:21 58:7 proceedings 97:5,7,9 process 84:21 85:7 prone 33:8 proper 33:13 provide 14:4 provided 6:19 7:3 98:19 99:8 provisional 10:7 10:8,17,19
--	---	---	---

[proximal - remains]

<p>proximal 70:10 70:11 72:9,14 proximally 70:9 publication 58:6 pull 9:10 pulmonaries 22:10 pulmonary 21:4 22:7,9,14,17,23 23:2,3,7,12,25 24:13 25:6,8,11 26:23 27:2,9 29:7,11 34:1 55:4 pulsatile 91:3 pulses 75:23 purposes 6:24 push 85:25 put 15:15 16:17 16:17 17:14,17 76:12 putting 43:6</p>	<p>r r 65:19,20 100:3 100:3 r&s 99:1,9 radius 65:20 range 23:10,11 23:14 24:6 29:4 29:15 31:4 33:21 34:14 47:17,20 54:9,12 60:15,16 63:6 64:17,20,23 66:20,25 67:3,7 67:10,14,17,23 72:16,22,24 73:8 73:11,13,16,20 74:1,2,7,9,22 ranges 23:25 46:7 59:11 60:1 61:17 63:14 64:16 66:9,14 73:5 74:4</p>	<p>99:9 ready 15:9 52:1 59:2 74:17 76:10 realize 64:14 really 34:12 35:21 reason 7:19 8:6 44:20 100:6,9,12 100:15,18,21 reasonable 7:23 8:4 reasons 44:15 recall 8:20 14:6 15:2,17,20 16:17 17:6,17,20,24 19:5,8,11 56:23 57:5 70:21 72:12 recess 50:24 94:25 recognize 74:21 record 6:11 50:22 97:8 red 51:3,3,3 redirect 95:5 reducing 44:6 refer 6:25 37:9 41:15 76:17,19 76:21,23,25 77:2 reference 39:10 39:12 referenced 8:16 12:18 98:6 references 76:14 referred 10:6 35:23</p>	<p>referring 29:22 36:15 42:3,5 53:13,23 54:14 61:21,23 71:21 75:6 77:24 83:8 reframe 7:22 regarding 6:19 14:21 regardless 57:3 region 21:25 26:6 regions 22:2 relate 40:11 42:7 related 7:6,8,20 relative 41:6 42:19 97:14 relatively 35:22 relax 89:22 90:10 relaxes 90:13 release 76:22 77:1,4,7,9,16 78:4,9,16 79:6 79:20 80:22 81:1 82:11,17,21 82:25 83:2,13 84:2,4,9,14 89:5 89:9 90:3,19 91:1 released 89:11 89:22 90:1,13 98:21 releasing 90:9 relevant 87:14 relying 62:13 72:24 remains 85:10 89:5</p>
<p>q quantities 28:3 question 7:19,21 7:22 17:19 18:23 24:16 31:14 40:23 44:5 58:3 59:3 66:18 73:23 79:3 85:5 86:11 87:6,9,12,16 88:22 91:24 92:4,9,10 94:5 questions 7:18 8:2 94:9 95:2</p>	<p>rapidpulse 1:8 2:8 4:3 6:16 98:4 100:1 rate 33:13 45:21 read 12:25 18:6 20:25 52:3 58:25 62:7 64:13 70:25 74:20 75:19 78:2 83:25 89:18 96:5 reading 29:23,25 62:3 63:22 77:21,22 78:20 78:23 83:19 89:13 98:23</p>		

[remembering - side]

remembering 46:2,16 remote 1:15 2:14 remotely 2:16 remove 36:1 55:12 removing 36:8 repeat 82:20 reported 1:22 reporter 2:18 38:14,17 97:4 represent 6:16 16:18 reproduced 70:18 requested 99:1,9 99:10 required 60:20 requirements 53:11 reread 24:16 59:3 respect 37:13,24 restate 7:22 restatement 35:7 result 74:24 83:15 results 84:15 retained 13:2,4 retracted 70:9 retrieve 31:17 return 98:17 99:6 returning 70:24 review 6:21 8:14 9:12 10:10,13,14 10:21,23 98:8,10 98:13 99:2	reviewed 8:13 8:15,21 9:18,22 10:1,2,11,16,18 10:20,25 11:1 15:7 16:22 17:13 25:23 38:25 49:23 58:14 61:5 reviewing 11:9 12:11 right 6:13 7:2,16 7:25 8:6,9 9:5,8 9:20 10:12 11:22 12:3 14:25 17:5 20:9 20:24 22:5 25:14,14,25 30:19 31:18 32:10 38:19 39:3 40:21 45:2 45:12 50:12 51:7,9,21,22 52:2 53:20 59:1 60:22 61:11 62:5 63:9,12,20 63:25 66:6,20 70:4 72:1,2,7 73:8,23 74:9 75:12,12,13 77:8 78:23 79:3,4 80:16 81:8,20 82:21 85:12 89:16 90:21 92:16 94:24 risk 24:11 25:4 26:14,19 27:12 27:16,19 31:9,12 31:15 32:11	road 3:7 room 7:13 roughly 14:12 routine 74:25 75:2 rubenstein 10:20 rules 7:17 99:8 runs 39:5 s s 100:3 saline 37:18,23 38:9 san 3:19 saying 15:8 41:5 60:17 90:12 says 77:6 78:2 83:25 85:1 90:19 scale 45:15,20 46:7,10 47:25 schedule 98:10 scone 24:15 scope 19:22 20:4 20:11 22:25 23:8,16 24:1,8 25:19 26:17 29:13 30:22 31:20 32:14 33:19 34:6 35:16 43:23 44:14 45:9,16 46:8,14 49:11 51:4,13 57:4 65:14 67:24 68:4,13 69:22 search 13:16,17	second 44:20 70:10 section 65:8 66:10 68:8 69:5 70:9,10,12 sectional 65:8 see 20:22 35:13 38:9 39:9,10 51:21 59:13 66:22 68:9,25 70:13 76:3 77:16 83:25 84:11 89:6,23 seeing 64:6 select 43:21 61:8 63:10,15 selected 62:18 63:7 74:2 selecting 61:13 selection 53:9,9 53:12 sentence 58:4,17 70:25 71:12,21 75:16 90:15,21 serve 13:19 set 62:6 97:6 severe 27:16,19 shaft 53:25 short 50:19 shorthand 2:18 97:3,9 show 81:5 shown 78:3 80:4 83:12 84:1 89:19 90:3 91:3 shut 89:20 side 33:6,6 48:11
--	---	---	---

[sign - support]

sign 98:16 99:5 signature 15:1,9 15:10,13,15,19 15:21 16:5,6,13 16:18,24 17:7,15 17:17,21,22 97:22 98:21,23 98:23 99:9 signed 17:2,3,6 17:25 significant 20:1 similar 20:6,8,15 28:10 52:12 simplest 36:24 simply 85:1 single 42:24 43:22 54:8 site 24:23 25:21 52:13 situation 34:18 82:15 situations 34:9 six 6:15 size 23:6,9,25 28:21 29:3,8,10 29:15 30:25 33:16 34:13 42:12,13,19 44:6 44:11 45:7,21 46:13 47:14 48:18 49:10,13 50:9 52:13 55:10 57:3,6 65:23 68:2 sized 50:15 sizes 23:10,11 30:25 34:14 46:7 47:20 48:7	56:1,7,12 skill 60:19 71:6 skilled 52:9 62:17 skip 10:22 small 23:17 24:2 28:11 29:1 48:11 63:4 64:23 smaller 24:7 27:12 41:16,20 42:9,13 44:18,20 44:23 49:19 57:19 66:3,4 soft 36:1 57:18 softer 35:23 solutions 98:7 somewhat 14:10 33:12 sorry 13:12 21:6 38:16 41:4 51:24 69:1,2 72:19 73:1 77:11 81:23 82:23 sound 7:23 8:4 sounds 50:21 sources 18:8,10 spaces 75:24 speak 25:10 38:16 specific 13:5 53:1 55:18 65:24 78:21 79:3 89:14 92:9 specifically 19:16 62:13 74:2	specified 50:13 speculating 14:10 spend 12:4,10 19:16 62:3 spent 19:20 spoke 18:11,13 spoken 14:20 squared 65:20 st 21:4 29:19,20 29:22,22 34:1 stage 80:4,16 84:21 85:7 standardized 52:4 start 14:9 35:14 40:3,23 66:20 76:16 81:14 83:1 started 14:11 starts 39:4 starving 28:12 state 6:10 12:25 18:6 33:23 51:23 52:3 58:20 59:23 60:10 62:7 70:25 74:20 96:11 97:4 98:9 98:12 stated 63:20 statement 62:12 75:1,18 states 1:1 2:1 6:20 58:18 89:17 90:21 stating 30:8 60:4	stays 82:12 84:3 89:9 90:3 stent 55:4 stenting 55:3 step 25:14 77:15 78:3 stipulation 98:20 street 3:17 strike 18:22 27:17 29:9 40:22 56:19 81:8,23 82:23 83:1 stroke 21:7 30:15,16,16 31:2 31:8,19 32:12 34:2 48:15,18 52:18 strokes 30:20 structural 48:1 55:3 subject 14:21 submillimeter 64:24 submitted 20:1 subscribed 97:16 sufficient 94:16 suffocate 28:6 suggested 63:11 suitable 64:18 64:21 suite 3:8,18 summary 44:8 summer 14:8 support 9:11 58:22,24 59:5
---	--	---	---

[support - today's]

62:13 sure 14:11 17:8 51:25 suspect 40:11 system 22:10,14 22:17 23:3,12,25 24:7 25:3,5,16 26:1 27:19,20 28:1,8 31:8 32:13 36:9 37:17 71:3,7,19 71:23 83:10 87:24 93:25 systems 20:21 21:1 30:9,21 33:24 34:4	taught 51:18 58:21 62:11,14 teach 61:12 83:13 89:10 90:8,16 teaches 68:7 71:14 72:15 84:13 90:1 teaching 60:14 71:16 90:6 teachings 61:18 61:20,21,23 63:13 90:24 technique 34:18 technology 41:17,20 44:7 teigen 10:14,16 10:18 18:22 51:15,18 71:7 73:3,17 telescope 72:13 72:13 telescoping 59:20 66:11 70:15,20,22,23 71:8 72:8 tell 66:14,25 80:13,25 87:25 93:23 telling 87:18 ten 54:13 term 33:4 75:2 testified 6:6 26:23 58:13 testifying 97:8 testimony 6:19 7:3 8:7 13:5,9 17:5,16 26:23	35:8 96:8 thank 6:13 7:9 9:20 13:15 14:13 50:12 51:21 95:2,6 thanks 38:17 94:24 thereof 97:12 thickness 42:15 45:11 46:22 47:1 53:5,7 54:12,13 thicknesses 54:9 things 52:21 63:18 think 11:17 22:5 32:9 43:16 45:12 69:2 94:6 94:7,16 third 17:7 thousandths 54:12,13,16 three 12:6,7 36:13 thrombectomy 20:21 25:2,16 26:1,15 30:9,21 31:7 32:12 33:24 34:8,11,21 34:22 35:1 36:7 41:3,14,18 43:13 44:6,12 48:5,7 55:3,7,17,25 56:9 57:9,12,16 60:14,23 71:15 72:15 74:24 thrombosis 21:2 21:9 22:23 23:1	23:7 24:13 25:3 25:10,16,22 26:2 26:16,25 28:23 29:1 34:1 35:15 35:20 48:22 61:1,6 thrombus 21:10 23:1 24:12,21,22 24:22 25:5,17 26:2,9 27:15,18 27:19 28:16 31:9,15 33:9 34:13,16 35:5,10 35:13,22 36:1,8 36:10 37:10 49:5,9,16,25 50:4,8 52:14 55:11 56:15 57:9,12,17,18,20 time 13:20 19:19 41:4 50:19 62:3 81:5,7,13,13,16 81:22 82:17 94:10,15,22 95:3 95:7 97:6 98:10 98:18,24 99:7 timeframe 14:12 times 65:8,21 tissue 28:19 31:21 32:17 title 8:25 9:2 59:21 today 6:17,18 7:11,14 8:7 11:4 37:9 43:16 53:5 91:11 95:2 today's 6:24 7:17,25 8:10,21
t	t 100:3,3 take 8:1 9:3 50:19,21 52:17 60:22 81:16 94:7 taken 2:15 97:5 takes 81:13 talked 63:18 talking 34:9 41:23,24 45:2 47:23 48:1 57:24 58:5,17 59:18 60:18 71:17 taper 69:23,25 70:2 tapered 68:8,21 69:5,10,13,20,21 tapering 68:11 68:22		

[today's - vasculature]

9:18,23 11:11,16 12:1,5,12,14 39:1 58:15 75:8 told 87:22,23 88:25 tools 41:18,23 top 46:10 76:17 total 12:7,14 trademark 1:1 2:1 6:20 transcribed 97:10 transcript 96:5 98:6,8,10,13,13 98:21 99:2,2 transcription 97:12 transfer 28:5 trauma 49:14 travel 28:2 31:16 traveling 28:11 travels 28:2 treat 25:16 26:1 28:22 29:11 30:10 31:1,8 34:4,13 55:10,11 56:2,14 62:19 treated 29:3 30:20 33:17 treating 25:3,5 27:8 31:19 32:7 32:11 48:25 treatment 25:18 33:25 48:15,21 52:18 60:6 trial 1:2 2:2 true 96:8	truthful 8:7 trying 17:8 34:13 44:22 48:25 53:20 55:10,11,11 56:2 56:14 61:9 62:5 65:9 73:24 tube 36:24 turn 9:21 12:21 12:23 14:23 20:18 38:19 39:3 51:7,9 64:9 66:6 70:4 74:16 75:13 76:5 82:10 89:3 turning 18:5 51:22 two 12:2,7 19:6 20:14 22:4 36:6 44:15 type 36:8,21 52:14 55:11 56:14 57:9,12 66:25 types 34:7,10,20 34:22 36:13 41:11 53:18 57:17 typical 23:14 46:22,25 56:1 typically 21:14 25:9,18,22 27:8 33:16 35:23 36:8 37:1 38:1,3 49:18,18 50:13 50:15 65:6	u u.s. 6:21 7:4 9:12 10:3 38:20 58:5 uh 35:4 72:3 ultimate 32:19 unable 29:15 uncorked 87:11 undersigned 97:3 understand 6:18 7:21 53:20 59:25 62:5 73:24 74:2 91:23 understanding 24:20 36:12 46:6,12 66:17 69:15 unit 54:14 united 1:1 2:1 6:20 unknown 91:15 91:17 92:25 93:2,16,18,23 unrealistic 61:7 upper 24:6 use 16:13 20:5 20:21 34:18 37:18 38:9 40:16,22 41:10 43:8 47:25 49:7 49:10 50:2,4 67:22 68:2 70:15 71:2,14,20 72:5,8 75:1 usually 44:17	v vacuum 75:22 75:23 76:24 77:3 78:5,6 79:14,16,21,22 80:5,11,16,19 81:1,2,8,9,10,22 81:23,25 82:2,6 82:8,12,18,19,22 82:23 83:3,4,14 83:15 84:3,4,8,9 84:14,16,23 85:2 85:6 86:4,14 87:1,3 88:13,15 88:16,18,20,22 88:24,25 89:4,8 89:10,20,21 90:1 90:2,9,13,20 91:2 valve 77:1,3,7,7 77:16 78:4,5,14 78:16 79:6,14,20 79:21 80:22 81:1,2,22,25 82:5,11,12,17 84:2,3 89:4,5,8,9 89:20 90:2,3,19 90:20 91:2,2 variable 53:7 varies 23:10 variety 59:16 60:4,5 71:14 72:5 various 18:8 vary 35:5,11,14 vasculature 28:12
---	---	--	---

[vein - yee]

vein 21:2,8,12 22:23 23:1,7 24:12 25:3,9,16 25:22 26:1,16,25 28:22 29:1 34:1 35:14,19 48:21 60:23,25 61:6 veins 21:1,10,14 21:15 23:2,11,15 venous 24:7 27:19 28:1 33:6 67:5 veritext 98:7,9 98:11 versus 42:23 43:3 45:7 69:21 vessel 23:6,9,10 23:11 32:8 34:14 49:13 52:14 55:10 56:13 57:3,6 65:1 vessels 23:15,25 28:4,21 29:3,8 29:10 30:25 44:24 56:1,12 64:19,22 videoconference 3:1 view 71:2 volume 1:18 2:14 5:4 65:3,9 65:12,24 66:3,4 68:12,15,17,21 69:3,5,8,13,20 70:1 96:16 vs 1:7 2:7 98:4 100:1	w wait 82:23 waived 98:23,23 waiving 98:20 wall 42:15 45:10 46:22 47:1 53:5 53:7 54:9,11,13 want 20:5 49:7 49:10 50:2,3 70:4 74:1 95:2 wanted 15:8 way 23:18 60:8 64:25 we've 33:25 50:17 58:5,17 60:18 83:7 94:6 went 77:11 whereof 97:16 wide 47:17 william 4:15 11:17,20 williams 3:5 witness 5:2 13:2 13:16,19 15:7,24 16:8,16 17:1,20 18:3 19:5,23 20:5,13 21:14,24 22:4,13,19 23:1 23:9,17 24:2,9 24:16 25:8,21 26:5,12,19 27:4 27:11,22 28:10 28:19,25 29:14 30:6,12,23 31:4 31:11,21,25 32:16,23 33:11 33:20 34:7,25 35:10,18 36:6,20	37:4,8,15,21 38:1,6,13 39:22 40:10 41:14 42:9,15,22 43:5 43:12,18,25 44:15 45:10,17 46:2,9,15,25 47:6,12,16,23 48:10,17,24 49:5 49:12,21 50:6 51:5,14 52:21 53:3,18 54:4,11 54:18 55:9,21 56:4,11,23 57:5 59:13 60:3,13 61:3,16,23 62:23 63:17,22 64:6 65:6,15,19 66:2 66:17 67:3,10,19 67:25 68:5,14,20 69:8,17,23 71:10 71:23 72:12 73:5,13,20 74:6 74:13 75:10 77:20 78:13,20 79:10,18,24 80:8 80:13,19 81:4,13 82:5,14 83:6,18 84:18 85:1,10,15 85:20,25 86:7,16 86:23 87:3,9,18 88:8,15,24 89:13 90:5,12 91:7,15 91:19 92:19,25 93:4,10,16 94:10 94:17,23 95:4 97:16 98:13,16 99:2,5 100:2,24	witnesses 97:7 word 20:6 work 14:9 48:4 55:19 worked 48:8 working 56:9 worst 32:23 wound 48:13
			x
			x 98:12
			y
			yang 10:25 58:6 58:8,12,14,21,22 58:23 59:4,8,10 59:14,19 60:3,8 60:13,14,24 61:12,24 62:11 62:13,14,20 63:11,13,20,22 66:7 68:7 70:5,7 71:4,8,14,19,20 72:4,4,7,15 73:3 73:6,16,18,21 75:18 76:2,6,13 79:1,5 83:13 84:13,22 88:3 89:10,17,25 90:6 90:8,16,21,24 91:9,12,25 92:10 92:16 93:7,13 yang's 66:10 70:15 yeah 43:18 50:21 83:21 94:19,20 year 7:2 yee 4:15 11:20 14:19

[yeel - zoom]

yeel	11:18
z	
zoom	3:1