WEBVTT

NOTE duration:"00:58:08"

NOTE recognizability:0.791

NOTE language:en-us

NOTE Confidence: 0.87581349

00:00:00.000 --> 00:00:02.286 So now I will turn the session over to

NOTE Confidence: 0.87581349

00:00:02.286 --> 00:00:04.195 Doctor Yaggi, who is our program director

NOTE Confidence: 0.87581349

00:00:04.195 --> 00:00:05.930 for Yale Center for Sleep Medicine,

NOTE Confidence: 0.87581349

00:00:05.930 --> 00:00:08.010 and he is going to introduce Doctor Dear.

NOTE Confidence: 0.816856613571429

00:00:09.550 --> 00:00:11.394 Thank you, doctor Hilbert.

NOTE Confidence: 0.816856613571429

00:00:11.394 --> 00:00:14.160 It is my distinct pleasure to

NOTE Confidence: 0.816856613571429

00:00:14.243 --> 00:00:16.627 introduce Doctor Jackie Gear,

NOTE Confidence: 0.816856613571429

00:00:16.630 --> 00:00:19.888 both as a new faculty member in our section,

NOTE Confidence: 0.816856613571429

00:00:19.890 --> 00:00:22.460 having just finished her fellowship

NOTE Confidence: 0.816856613571429

00:00:22.460 --> 00:00:25.030 training and as our inaugural

NOTE Confidence: 0.816856613571429

00:00:25.109 --> 00:00:27.599 speaker this academic year and

NOTE Confidence: 0.816856613571429

00:00:27.599 --> 00:00:30.089 our Yale Sleep Medicine Seminar.

NOTE Confidence: 0.816856613571429

00:00:30.090 --> 00:00:32.150 Dr Gear completed her undergraduate

NOTE Confidence: 0.816856613571429

00:00:32.150 --> 00:00:33.798 training at Washington University

NOTE Confidence: 0.816856613571429

00:00:33.798 --> 00:00:36.118 in Saint Louis Medical School, NYU.

NOTE Confidence: 0.816856613571429

00:00:36.118 --> 00:00:37.906 And then we were fortunate to

NOTE Confidence: 0.816856613571429

00:00:37.906 --> 00:00:39.848 recruit her to Yale, where she.

NOTE Confidence: 0.816856613571429

00:00:39.848 --> 00:00:41.882 Really has stayed for her clinical

NOTE Confidence: 0.816856613571429

00:00:41.882 --> 00:00:43.369 training both as an intern,

NOTE Confidence: 0.816856613571429

00:00:43.370 --> 00:00:45.630 a resident, a chief resident,

NOTE Confidence: 0.816856613571429

00:00:45.630 --> 00:00:48.040 and fellowship training in pulmonary

NOTE Confidence: 0.816856613571429

00:00:48.040 --> 00:00:50.450 critical care and Sleep Medicine.

NOTE Confidence: 0.816856613571429

00:00:50.450 --> 00:00:53.066 And she has been incredibly productive

NOTE Confidence: 0.816856613571429

00:00:53.066 --> 00:00:55.553 during her fellowship and has managed

NOTE Confidence: 0.816856613571429

00:00:55.553 --> 00:00:57.884 to advance in a very short time.

NOTE Confidence: 0.816856613571429

00:00:57.890 --> 00:01:01.290 Our understanding of sleep disordered

NOTE Confidence: 0.816856613571429

00:01:01.290 --> 00:01:04.010 breathing and intracranial hemorrhage,

NOTE Confidence: 0.816856613571429

00:01:04.010 --> 00:01:06.610 which is a very common type of stroke,

NOTE Confidence: 0.816856613571429

00:01:06.610 --> 00:01:10.929 results in considerable mortality as well as.

NOTE Confidence: 0.816856613571429

00:01:10.930 --> 00:01:13.482 Functional and and cognitive

NOTE Confidence: 0.816856613571429

00:01:13.482 --> 00:01:15.396 impairment and morbidity.

NOTE Confidence: 0.816856613571429

00:01:15.400 --> 00:01:17.308 She has already received numerous awards

NOTE Confidence: 0.816856613571429

00:01:17.308 --> 00:01:19.720 and grants for her work in this domain,

NOTE Confidence: 0.816856613571429

00:01:19.720 --> 00:01:22.198 including salary support from the NIH,

NOTE Confidence: 0.816856613571429

00:01:22.200 --> 00:01:24.468 NINDS and stroke net during her

NOTE Confidence: 0.816856613571429

00:01:24.468 --> 00:01:26.565 fellowship training a TS funding

NOTE Confidence: 0.816856613571429

00:01:26.565 --> 00:01:28.617 through the Aspire Fellowship,

NOTE Confidence: 0.816856613571429

00:01:28.620 --> 00:01:30.845 which is designed to promote

NOTE Confidence: 0.816856613571429

00:01:30.845 --> 00:01:33.070 sleep research among pulmonary and

NOTE Confidence: 0.816856613571429

00:01:33.147 --> 00:01:35.339 critical care medicine fellows.

NOTE Confidence: 0.816856613571429

00:01:35.340 --> 00:01:37.626 She's also received an American Academy

NOTE Confidence: 0.816856613571429

00:01:37.626 --> 00:01:39.620 of Sleep Medicine physician Scientist

NOTE Confidence: 0.816856613571429

00:01:39.620 --> 00:01:41.660 Training award and most recently.

NOTE Confidence: 0.816856613571429

00:01:41.660 --> 00:01:43.990 The Yale.

NOTE Confidence: 0.816856613571429

00:01:43.990 --> 00:01:46.890 But why CI RCTs,

NOTE Confidence: 0.816856613571429

00:01:46.890 --> 00:01:50.066 a clinical scholars KL2 award all

NOTE Confidence: 0.816856613571429

00:01:50.066 --> 00:01:52.901 related to her work at this interface of

NOTE Confidence: 0.816856613571429

00:01:52.901 --> 00:01:55.529 intracranial hemorrhage and and sleep apnea.

NOTE Confidence: 0.816856613571429

00:01:55.530 --> 00:01:57.682 And today she's going to talk to us

NOTE Confidence: 0.816856613571429

00:01:57.682 --> 00:01:59.442 more broadly about sleep apnea and

NOTE Confidence: 0.816856613571429

00:01:59.442 --> 00:02:01.709 stroke and share with her some of the

NOTE Confidence: 0.816856613571429

00:02:01.709 --> 00:02:04.120 work that she has has done in this domain.

NOTE Confidence: 0.816856613571429

00:02:04.120 --> 00:02:04.690 Welcome,

NOTE Confidence: 0.816856613571429

00:02:04.690 --> 00:02:05.260 Jackie.

NOTE Confidence: 0.867307558333333

00:02:08.050 --> 00:02:10.409 Wow. Thank you so much car for

NOTE Confidence: 0.867307558333333

00:02:10.409 --> 00:02:12.202 that warm introduction and thanks

NOTE Confidence: 0.867307558333333

00:02:12.202 --> 00:02:14.350 for everyone for being here today.

NOTE Confidence: 0.867307558333333

00:02:14.350 --> 00:02:16.177 It's an honor to give the first

NOTE Confidence: 0.867307558333333

00:02:16.177 --> 00:02:17.729 sleep seminar of the semester.

NOTE Confidence: 0.867307558333333

00:02:17.730 --> 00:02:19.095 I actually hadn't realized that

NOTE Confidence: 0.867307558333333

00:02:19.095 --> 00:02:21.170 initially when I signed up for the state.

NOTE Confidence: 0.867307558333333

00:02:21.170 --> 00:02:24.050 So lots of lots to live up to you

NOTE Confidence: 0.867307558333333

00:02:24.050 --> 00:02:27.304 or or maybe not so much we'll save.

NOTE Confidence: 0.867307558333333

00:02:27.310 --> 00:02:29.614 So I am extremely excited today to talk

NOTE Confidence: 0.867307558333333

00:02:29.614 --> 00:02:32.329 to you all about sleep apnea and stroke.

NOTE Confidence: 0.867307558333333

00:02:32.330 --> 00:02:35.882 It's a topic of great academic

NOTE Confidence: 0.867307558333333

00:02:35.882 --> 00:02:38.250 interest to me and.

NOTE Confidence: 0.867307558333333

00:02:38.250 --> 00:02:40.875 Before we get started, let me just.

NOTE Confidence: 0.726424056625

00:02:43.740 --> 00:02:45.796 There we go, and before we get started,

NOTE Confidence: 0.726424056625

00:02:45.800 --> 00:02:48.336 I'll just put the CME slide up again.

NOTE Confidence: 0.726424056625

00:02:48.340 --> 00:02:50.237 I think you all already saw it,

NOTE Confidence: 0.726424056625

00:02:50.240 --> 00:02:52.890 and doctor Hilbert went through the

NOTE Confidence: 0.726424056625

00:02:52.890 --> 00:02:55.530 the rules and I have no personal and

NOTE Confidence: 0.726424056625

00:02:55.530 --> 00:02:58.018 relevant financial disclosures to share.

NOTE Confidence: 0.867801565

00:03:00.310 --> 00:03:01.955 So before I delve into

NOTE Confidence: 0.867801565

00:03:01.955 --> 00:03:03.600 the outline for the talk,

NOTE Confidence: 0.867801565

00:03:03.600 --> 00:03:06.264 I'll just take a minute to share with you

NOTE Confidence: 0.867801565

00:03:06.264 --> 00:03:08.925 how I became interested in this domain.

NOTE Confidence: 0.867801565

00:03:08.930 --> 00:03:11.422 And so as a first year pulmonary

NOTE Confidence: 0.867801565

00:03:11.422 --> 00:03:13.070 and critical care fellow,

NOTE Confidence: 0.867801565

00:03:13.070 --> 00:03:16.870 I had an early rotation in the Neuro

NOTE Confidence: 0.867801565

00:03:16.870 --> 00:03:19.426 ICU where I had many stroke patients,

NOTE Confidence: 0.867801565

00:03:19.430 --> 00:03:21.962 but also many ICA or interest

NOTE Confidence: 0.867801565

00:03:21.962 --> 00:03:23.228 cerebral hemorrhage patients,

NOTE Confidence: 0.867801565

00:03:23.230 --> 00:03:24.868 which is not something I had seen

NOTE Confidence: 0.867801565

00:03:24.868 --> 00:03:26.690 much of as a medicine resident.

NOTE Confidence: 0.867801565

00:03:26.690 --> 00:03:29.554 And then there was a a great component.

NOTE Confidence: 0.867801565

00:03:29.560 --> 00:03:32.060 Happenstance as I think is

NOTE Confidence: 0.867801565

00:03:32.060 --> 00:03:34.560 typical for people's research on

NOTE Confidence: 0.867801565

00:03:34.653 --> 00:03:37.197 trajectory and career stories.

NOTE Confidence: 0.867801565

00:03:37.200 --> 00:03:38.076 So it was,

NOTE Confidence: 0.867801565

00:03:38.076 --> 00:03:40.800 first of all the the time of year in

NOTE Confidence: 0.867801565

00:03:40.800 --> 00:03:44.601 that mid fall where you're supposed

NOTE Confidence: 0.867801565

00:03:44.601 --> 00:03:46.683 to figure out what you're going

NOTE Confidence: 0.867801565

00:03:46.683 --> 00:03:48.462 to do with your copious research

NOTE Confidence: 0.867801565

00:03:48.462 --> 00:03:50.639 time in the second and third years.

NOTE Confidence: 0.867801565

00:03:50.640 --> 00:03:53.628 And and so I was sort of pondering that

NOTE Confidence: 0.867801565

00:03:53.628 --> 00:03:56.596 and happened to be working with them.

NOTE Confidence: 0.867801565

00:03:56.600 --> 00:03:58.670 Kevin, Chef in the neuro ICU,

NOTE Confidence: 0.867801565

00:03:58.670 --> 00:03:59.693 was my attending.

NOTE Confidence: 0.867801565

00:03:59.693 --> 00:04:01.739 Time and Kevin is not only

NOTE Confidence: 0.867801565

00:04:01.739 --> 00:04:03.859 a world class researcher,

NOTE Confidence: 0.867801565

00:04:03.860 --> 00:04:06.158 but also an outstanding clinician and

NOTE Confidence: 0.867801565

00:04:06.158 --> 00:04:09.540 has a a strong mentorship track record.

NOTE Confidence: 0.867801565

00:04:09.540 --> 00:04:12.067 And so he and Clara had actually

NOTE Confidence: 0.867801565

00:04:12.067 --> 00:04:14.430 just received R1 funding for a

NOTE Confidence: 0.867801565

00:04:14.430 --> 00:04:16.836 sleep and a schematic stroke trial,

NOTE Confidence: 0.867801565

00:04:16.840 --> 00:04:19.120 which I'll come back to later on in the talk.

NOTE Confidence: 0.867801565

00:04:19.120 --> 00:04:21.129 But Kevin wondered if I might have

NOTE Confidence: 0.867801565

00:04:21.129 --> 00:04:22.936 any interest in becoming a stroke

NOTE Confidence: 0.867801565

00:04:22.936 --> 00:04:24.987 researcher and he took me out for

NOTE Confidence: 0.867801565

00:04:25.052 --> 00:04:27.236 Arethusa ice cream to discuss it more.

NOTE Confidence: 0.867801565

00:04:27.240 --> 00:04:29.220 And how could I say no?

NOTE Confidence: 0.867801565

00:04:29.220 --> 00:04:30.453 And so I.

NOTE Confidence: 0.867801565

00:04:30.453 --> 00:04:33.330 It really was interested in the topic,

NOTE Confidence: 0.867801565

00:04:33.330 --> 00:04:36.450 which I learned a lot about the relationship

NOTE Confidence: 0.867801565

00:04:36.450 --> 00:04:39.048 between sleep apnea and ischemic stroke,

NOTE Confidence: 0.867801565

00:04:39.050 --> 00:04:40.200 but wondered if maybe the

NOTE Confidence: 0.867801565

00:04:40.200 --> 00:04:41.350 same was true for ICH,

NOTE Confidence: 0.867801565

00:04:41.350 --> 00:04:43.030 which I think was the big question.

NOTE Confidence: 0.867801565

00:04:43.030 --> 00:04:44.608 I discovered that there was a

NOTE Confidence: 0.867801565

00:04:44.608 --> 00:04:46.439 huge gap in the literature and

NOTE Confidence: 0.867801565

00:04:46.439 --> 00:04:48.224 there's actually hardly any work

NOTE Confidence: 0.867801565

00:04:48.224 --> 00:04:50.530 that had been done in that domain.

NOTE Confidence: 0.867801565

00:04:50.530 --> 00:04:51.990 So I was intrigued.

NOTE Confidence: 0.867801565

00:04:51.990 --> 00:04:55.057 I had a dream team for my from

NOTE Confidence: 0.867801565

00:04:55.057 --> 00:04:57.822 my mentors and so we just started

NOTE Confidence: 0.867801565

00:04:57.830 --> 00:05:00.530 working and have been continuing it.

NOTE Confidence: 0.867801565

00:05:00.530 --> 00:05:01.326 Ever since.

NOTE Confidence: 0.867801565

00:05:01.326 --> 00:05:02.122 And so.

NOTE Confidence: 0.867801565

00:05:02.122 --> 00:05:05.565 Today I'm gonna talk to you about the

NOTE Confidence: 0.867801565

00:05:05.565 --> 00:05:08.463 evidence that links sleep apnea and

NOTE Confidence: 0.867801565

00:05:08.463 --> 00:05:11.550 strokes are sort of what do we know,

NOTE Confidence: 0.867801565

00:05:11.550 --> 00:05:13.005 where are we?

NOTE Confidence: 0.867801565

00:05:13.005 --> 00:05:14.945 Explore the proposed mechanisms.

NOTE Confidence: 0.867801565

00:05:14.950 --> 00:05:17.590 So why, why is it,

NOTE Confidence: 0.867801565

00:05:17.590 --> 00:05:18.128 you know,

NOTE Confidence: 0.867801565

00:05:18.128 --> 00:05:20.750 why is sleep apnea a risk factor for stroke?

NOTE Confidence: 0.867801565

00:05:20.750 --> 00:05:22.438 And then talk to you at the end

NOTE Confidence: 0.867801565

00:05:22.438 --> 00:05:23.850 about the role of treatment.

NOTE Confidence: 0.803802308333333

00:05:26.760 --> 00:05:30.120 So first we'll review the evidence.

NOTE Confidence: 0.803802308333333

00:05:30.120 --> 00:05:32.507 And so I know I don't have to go into too

NOTE Confidence: 0.803802308333333

00:05:32.507 --> 00:05:34.577 much detail for this particular audience,

NOTE Confidence: 0.803802308333333

00:05:34.580 --> 00:05:36.236 but since it is the beginning of the

NOTE Confidence: 0.803802308333333

00:05:36.236 --> 00:05:38.064 academic year and we have learners with

NOTE Confidence: 0.803802308333333

00:05:38.064 --> 00:05:39.423 variable experience, I'll just take

NOTE Confidence: 0.803802308333333

00:05:39.423 --> 00:05:41.320 a moment to talk about sleep apnea.

NOTE Confidence: 0.803802308333333

00:05:41.320 --> 00:05:43.678 And so OSA is a common form of sleep

NOTE Confidence: 0.803802308333333

00:05:43.678 --> 00:05:45.613 disordered breathing and it results

NOTE Confidence: 0.803802308333333

00:05:45.613 --> 00:05:47.623 from intermittent upper airway collapse

NOTE Confidence: 0.803802308333333

00:05:47.623 --> 00:05:49.428 leading to apneas and hypopneas,

NOTE Confidence: 0.803802308333333

00:05:49.430 --> 00:05:53.180 which causes cycle of abnormal Physiology,

NOTE Confidence: 0.803802308333333

00:05:53.180 --> 00:05:55.304 which includes hypoxia,

NOTE Confidence: 0.803802308333333

00:05:55.304 --> 00:05:56.720 sympathetic activation,

NOTE Confidence: 0.803802308333333

00:05:56.720 --> 00:05:58.463 hemodynamic disturbance and

NOTE Confidence: 0.803802308333333

00:05:58.463 --> 00:06:00.787 disruption of sleep architecture.

NOTE Confidence: 0.803802308333333

00:06:00.790 --> 00:06:04.492 Sleep apnea effects up to 40% of the

NOTE Confidence: 0.803802308333333

00:06:04.492 --> 00:06:06.047 general population in the literature,

NOTE Confidence: 0.803802308333333

00:06:06.050 --> 00:06:08.789 and probably more.

NOTE Confidence: 0.803802308333333

00:06:08.790 --> 00:06:10.584 And it's an established an independent

NOTE Confidence: 0.803802308333333

00:06:10.584 --> 00:06:12.170 risk factor for ischemic stroke,

NOTE Confidence: 0.803802308333333

00:06:12.170 --> 00:06:15.542 which is present in up to 75%

NOTE Confidence: 0.803802308333333

00:06:15.542 --> 00:06:20.300 of this patient population. Um.

NOTE Confidence: 0.803802308333333

00:06:20.300 --> 00:06:22.380 So some background on stroke.

NOTE Confidence: 0.803802308333333

00:06:22.380 --> 00:06:24.684 So it's the third leading cause of death

NOTE Confidence: 0.803802308333333

00:06:24.684 --> 00:06:27.477 in the United States and the 2nd globally.

NOTE Confidence: 0.803802308333333

00:06:27.480 --> 00:06:30.032 And there are almost a million strokes a

NOTE Confidence: 0.803802308333333

00:06:30.032 --> 00:06:33.074 year in the United States and more than

NOTE Confidence: 0.803802308333333

00:06:33.074 --> 00:06:35.876 150,000 stroke related deaths every year.

NOTE Confidence: 0.803802308333333

00:06:35.880 --> 00:06:38.130 And so scheming stroke is the

NOTE Confidence: 0.803802308333333

00:06:38.130 --> 00:06:39.704 most common stroke subtype,

NOTE Confidence: 0.803802308333333

00:06:39.704 --> 00:06:40.940 followed by interest,

NOTE Confidence: 0.803802308333333

00:06:40.940 --> 00:06:44.369 cerebral hemorrhage ICH.

NOTE Confidence: 0.803802308333333

00:06:44.370 --> 00:06:45.780 Stroke is the leading cause

NOTE Confidence: 0.803802308333333

00:06:45.780 --> 00:06:46.908 of long term disability,

NOTE Confidence: 0.803802308333333

00:06:46.910 --> 00:06:50.295 and it costs an estimated $35

NOTE Confidence: 0.803802308333333

00:06:50.295 --> 00:06:54.285 billion a year related to healthcare,

NOTE Confidence: 0.803802308333333

00:06:54.290 --> 00:06:57.020 medication and missed days of productivity.

NOTE Confidence: 0.844753267142857

00:06:59.470 --> 00:07:01.255 So if you were specifically

NOTE Confidence: 0.844753267142857

00:07:01.255 --> 00:07:04.000 on spontaneous ICH.

NOTE Confidence: 0.844753267142857

00:07:04.000 --> 00:07:05.355 Which accounts for a substantial

NOTE Confidence: 0.844753267142857

00:07:05.355 --> 00:07:06.439 portion of all strokes,

NOTE Confidence: 0.844753267142857

00:07:06.440 --> 00:07:09.289 but I think we are less familiar

NOTE Confidence: 0.844753267142857

00:07:09.289 --> 00:07:11.356 with so a common research

NOTE Confidence: 0.844753267142857

00:07:11.356 --> 00:07:13.840 definition of ICH is non traumatic,

NOTE Confidence: 0.844753267142857

00:07:13.840 --> 00:07:16.100 abrupt onset of severe headache,

NOTE Confidence: 0.844753267142857

00:07:16.100 --> 00:07:17.724 altered level of consciousness,

NOTE Confidence: 0.844753267142857

00:07:17.724 --> 00:07:19.754 and or focal neurologic deficit,

NOTE Confidence: 0.844753267142857

00:07:19.760 --> 00:07:21.650 with an associated focal collection

NOTE Confidence: 0.844753267142857

00:07:21.650 --> 00:07:24.030 of blood within the brain frankoma

NOTE Confidence: 0.844753267142857

00:07:24.030 --> 00:07:26.150 seen on neuroimaging or autopsy.

NOTE Confidence: 0.844753267142857

00:07:26.150 --> 00:07:29.500 It accounts for up to 20% of all strokes

NOTE Confidence: 0.844753267142857

00:07:29.500 --> 00:07:32.366 and has a 50% thirty day mortality,

NOTE Confidence: 0.844753267142857

00:07:32.366 --> 00:07:36.913 and the the half who do survive tend to

NOTE Confidence: 0.844753267142857

00:07:36.913 --> 00:07:39.585 have significant functional limitations.

NOTE Confidence: 0.844753267142857

00:07:39.590 --> 00:07:41.690 And risk factors include hypertension,

NOTE Confidence: 0.844753267142857

00:07:41.690 --> 00:07:43.850 age, diabetes, smoking,

NOTE Confidence: 0.844753267142857

00:07:43.850 --> 00:07:44.570 anticoagulation,

NOTE Confidence: 0.844753267142857

00:07:44.570 --> 00:07:46.010 particularly warfarin.

NOTE Confidence: 0.844753267142857

00:07:46.010 --> 00:07:48.215 And so you'll you'll kind of note

NOTE Confidence: 0.844753267142857

00:07:48.215 --> 00:07:50.483 that these are are fairly similar

NOTE Confidence: 0.844753267142857

00:07:50.483 --> 00:07:52.573 risk factors to ischemic stroke.

NOTE Confidence: 0.85807122465

00:07:55.550 --> 00:07:58.390 So there have been a number of studies

NOTE Confidence: 0.85807122465

00:07:58.390 --> 00:07:59.567 providing epidemiologic evidence

NOTE Confidence: 0.85807122465

00:07:59.567 --> 00:08:01.191 and solidifying the connection

NOTE Confidence: 0.85807122465

00:08:01.191 --> 00:08:03.221 between sleep apnea and stroke,

NOTE Confidence: 0.85807122465

00:08:03.230 --> 00:08:05.246 and I I just have a sampling of

NOTE Confidence: 0.85807122465

00:08:05.246 --> 00:08:06.930 them listed here on this slide,

NOTE Confidence: 0.85807122465

00:08:06.930 --> 00:08:08.745 and I'll draw your attention

NOTE Confidence: 0.85807122465

00:08:08.745 --> 00:08:10.197 to the rightmost column,

NOTE Confidence: 0.85807122465

00:08:10.200 --> 00:08:14.405 which shows a consistently strong

NOTE Confidence: 0.85807122465

00:08:14.405 --> 00:08:17.900 association of high prevalence of OSA

NOTE Confidence: 0.85807122465

00:08:17.900 --> 00:08:20.550 in the respective stroke populations

NOTE Confidence: 0.85807122465

00:08:20.644 --> 00:08:23.639 relative to the general population.

NOTE Confidence: 0.85807122465

00:08:23.640 --> 00:08:25.656 And actually our own doctor Moseman

NOTE Confidence: 0.85807122465

00:08:25.656 --> 00:08:28.081 was one of the first to make

NOTE Confidence: 0.85807122465

00:08:28.081 --> 00:08:30.097 this observation and you can see

NOTE Confidence: 0.85807122465

00:08:30.097 --> 00:08:32.191 his case control study in 1995

NOTE Confidence: 0.85807122465

00:08:32.191 --> 00:08:34.088 at the top of the list there.

NOTE Confidence: 0.85807122465

00:08:34.090 --> 00:08:36.050 And there have been tons

NOTE Confidence: 0.85807122465

00:08:36.050 --> 00:08:37.618 of studies to follow.

NOTE Confidence: 0.85807122465

00:08:37.620 --> 00:08:40.084 And as you can sort of see from

NOTE Confidence: 0.85807122465

00:08:40.084 --> 00:08:42.140 the study population column,

NOTE Confidence: 0.85807122465

00:08:42.140 --> 00:08:44.210 most of them are looking at

NOTE Confidence: 0.85807122465

00:08:44.210 --> 00:08:46.371 ischemic stroke and Tia and a

NOTE Confidence: 0.85807122465

00:08:46.371 --> 00:08:48.156 few of them are indiscriminate.

NOTE Confidence: 0.85807122465

00:08:48.160 --> 00:08:49.248 And at the bottom,

NOTE Confidence: 0.85807122465

00:08:49.248 --> 00:08:51.660 you can see a reference for a study

NOTE Confidence: 0.85807122465

00:08:51.660 --> 00:08:53.727 that I conducted during fellowship where

NOTE Confidence: 0.85807122465

00:08:53.727 --> 00:08:55.449 we look specifically at interest rate,

NOTE Confidence: 0.85807122465

00:08:55.450 --> 00:08:57.970 real hemorrhage patients and and

NOTE Confidence: 0.85807122465

00:08:57.970 --> 00:09:00.490 matched controls and found that

NOTE Confidence: 0.85807122465

00:09:00.572 --> 00:09:02.888 there was also a very strong

NOTE Confidence: 0.85807122465

00:09:02.888 --> 00:09:05.300 prevalence of OSA in the cases,

NOTE Confidence: 0.85807122465

00:09:05.300 --> 00:09:06.868 which was significantly more

NOTE Confidence: 0.85807122465

00:09:06.868 --> 00:09:08.436 than in the controls.

NOTE Confidence: 0.85807122465

00:09:08.440 --> 00:09:11.416 And I'll tell you more about that later.

NOTE Confidence: 0.85807122465

00:09:11.420 --> 00:09:13.849 So the real question arising from many

NOTE Confidence: 0.85807122465

00:09:13.849 --> 00:09:16.349 of these early studies was whether sleep

NOTE Confidence: 0.85807122465

00:09:16.349 --> 00:09:18.960 apnea was a risk factor for stroke,

NOTE Confidence: 0.85807122465

00:09:18.960 --> 00:09:21.678 or if stroke caused sleep apnea.

NOTE Confidence: 0.857252626428571

00:09:24.850 --> 00:09:26.915 So the directionality of association

NOTE Confidence: 0.857252626428571

00:09:26.915 --> 00:09:29.478 was unclear based on the studies

NOTE Confidence: 0.857252626428571

00:09:29.478 --> 00:09:31.566 I just mentioned, and ultimately

NOTE Confidence: 0.857252626428571

00:09:31.566 --> 00:09:33.606 it appears to be bidirectional,

NOTE Confidence: 0.857252626428571

00:09:33.610 --> 00:09:35.670 but strongly favoring sleep

NOTE Confidence: 0.857252626428571

00:09:35.670 --> 00:09:38.760 apnea as a cause for stroke.

NOTE Confidence: 0.857252626428571

00:09:38.760 --> 00:09:42.127 So some evidence to support the the

NOTE Confidence: 0.857252626428571

00:09:42.127 --> 00:09:45.539 notion that stroke can cause sleep apnea

NOTE Confidence: 0.857252626428571

00:09:45.540 --> 00:09:48.921 can be found in some earlier studies

NOTE Confidence: 0.857252626428571

00:09:48.921 --> 00:09:50.919 looking at neuromuscular weakness

NOTE Confidence: 0.857252626428571

00:09:50.919 --> 00:09:53.721 of the upper airway dilator muscles

NOTE Confidence: 0.857252626428571

00:09:53.721 --> 00:09:56.708 which can lead to airway collapse.

NOTE Confidence: 0.857252626428571

00:09:56.710 --> 00:10:00.194 And individuals who are

NOTE Confidence: 0.857252626428571

00:10:00.194 --> 00:10:01.936 presumably predisposed.

NOTE Confidence: 0.857252626428571

00:10:01.940 --> 00:10:05.048 Far more compelling is the notion that

NOTE Confidence: 0.857252626428571

00:10:05.048 --> 00:10:08.567 sleep apnea is a risk factor for stroke.

NOTE Confidence: 0.857252626428571

00:10:08.570 --> 00:10:11.130 And support for this comes from many studies,

NOTE Confidence: 0.857252626428571

00:10:11.130 --> 00:10:15.546 and the reasoning is is broad,

NOTE Confidence: 0.857252626428571

00:10:15.550 --> 00:10:18.514 including the fact that sleep apnea

NOTE Confidence: 0.857252626428571

00:10:18.514 --> 00:10:20.890 is strongly associated with Tia,

NOTE Confidence: 0.857252626428571

00:10:20.890 --> 00:10:23.386 in which no residual deficits remain.

NOTE Confidence: 0.857252626428571

00:10:23.390 --> 00:10:26.750 And studies have shown that sleep apnea

NOTE Confidence: 0.857252626428571

00:10:26.750 --> 00:10:28.963 patients with vulvar neuromuscular

NOTE Confidence: 0.857252626428571

00:10:28.963 --> 00:10:32.265 weakness and continue to have sleep apnea

NOTE Confidence: 0.857252626428571

00:10:32.265 --> 00:10:34.840 even after recovery from their deficits.

NOTE Confidence: 0.857252626428571

00:10:34.840 --> 00:10:35.339 Additionally,

NOTE Confidence: 0.857252626428571

00:10:35.339 --> 00:10:39.830 we see that the presence of OSA is generally

NOTE Confidence: 0.857252626428571

00:10:39.921 --> 00:10:45.199 indiscriminate of location or stroke subtype.

NOTE Confidence: 0.857252626428571

00:10:45.200 --> 00:10:46.524 Which suggests that stroke

NOTE Confidence: 0.857252626428571

00:10:46.524 --> 00:10:48.179 is less likely the cause.

NOTE Confidence: 0.857252626428571

00:10:48.180 --> 00:10:50.982 And then finally sleep apnea is

NOTE Confidence: 0.857252626428571

00:10:50.982 --> 00:10:53.699 strongly associated with wake up stroke.

NOTE Confidence: 0.857252626428571

00:10:53.700 --> 00:10:55.842 So we'll delve more into these

NOTE Confidence: 0.857252626428571

00:10:55.842 --> 00:10:56.556 mechanisms shortly.

NOTE Confidence: 0.857252626428571

00:10:56.560 --> 00:10:59.998 And there's also the issue of

NOTE Confidence: 0.857252626428571

00:10:59.998 --> 00:11:01.717 confounding by hypertension,

NOTE Confidence: 0.857252626428571

00:11:01.720 --> 00:11:05.272 diabetes, hyperlipidemia and obesity,

NOTE Confidence: 0.857252626428571

00:11:05.272 --> 00:11:07.516 and which I will also try to

NOTE Confidence: 0.857252626428571

00:11:07.516 --> 00:11:08.420 address in a bit.

NOTE Confidence: 0.878731831428571

00:11:12.130 --> 00:11:14.706 So as many of you are aware,

NOTE Confidence: 0.878731831428571

00:11:14.710 --> 00:11:18.322 our own Clara Yagis Fellowship project was

NOTE Confidence: 0.878731831428571

00:11:18.322 --> 00:11:20.400 actually a groundbreaking contribution

NOTE Confidence: 0.878731831428571

00:11:20.400 --> 00:11:23.976 to the domain of sleep apnea and stroke.

NOTE Confidence: 0.878731831428571

00:11:23.980 --> 00:11:27.004 And was one of the first to

NOTE Confidence: 0.878731831428571

00:11:27.004 --> 00:11:29.317 prospectively tackle this chicken and

NOTE Confidence: 0.878731831428571

00:11:29.317 --> 00:11:32.125 egg on sort of causation question?

NOTE Confidence: 0.878731831428571

00:11:32.130 --> 00:11:34.788 So in his observational cohort study,

NOTE Confidence: 0.878731831428571

00:11:34.790 --> 00:11:36.240 consecutive patients

NOTE Confidence: 0.878731831428571

00:11:36.240 --> 00:11:37.690 underwent polysomnography.

NOTE Confidence: 0.878731831428571

00:11:37.690 --> 00:11:41.315 And subsequent strokes and deaths

NOTE Confidence: 0.878731831428571

00:11:41.320 --> 00:11:43.548 were verified and recorded.

NOTE Confidence: 0.878731831428571

00:11:43.548 --> 00:11:46.333 And the diagnosis of OSA,

NOTE Confidence: 0.878731831428571

00:11:46.340 --> 00:11:47.366 I should mention,

NOTE Confidence: 0.878731831428571

00:11:47.366 --> 00:11:49.760 was based on HIV 5 or greater,

NOTE Confidence: 0.878731831428571

00:11:49.760 --> 00:11:51.695 and those without OSA served

NOTE Confidence: 0.878731831428571

00:11:51.695 --> 00:11:52.856 as the comparators.

NOTE Confidence: 0.878731831428571

00:11:52.860 --> 00:11:56.510 So what they found was that 68% of

NOTE Confidence: 0.878731831428571

00:11:56.510 --> 00:11:58.635 enrolled patients had sleep apnea,

NOTE Confidence: 0.878731831428571

00:11:58.640 --> 00:12:01.153 and that the presence of sleep apnea

NOTE Confidence: 0.878731831428571

00:12:01.153 --> 00:12:02.771 was associated with significantly

NOTE Confidence: 0.878731831428571

00:12:02.771 --> 00:12:05.579 higher likelihood of stroke or death,

NOTE Confidence: 0.878731831428571

00:12:05.580 --> 00:12:09.780 even after they adjusted for confounders.

NOTE Confidence: 0.878731831428571

00:12:09.780 --> 00:12:12.726 So this is depicted in these

NOTE Confidence: 0.878731831428571

00:12:12.726 --> 00:12:14.660 two items from their paper here.

NOTE Confidence: 0.878731831428571

00:12:14.660 --> 00:12:16.578 So on the left you can see

NOTE Confidence: 0.878731831428571

00:12:16.578 --> 00:12:17.850 the Kaplan Meier curve.

NOTE Confidence: 0.878731831428571

00:12:17.850 --> 00:12:20.174 And and they also found that the

NOTE Confidence: 0.878731831428571

00:12:20.174 --> 00:12:22.072 severity of sleep apnea correlated

NOTE Confidence: 0.878731831428571

00:12:22.072 --> 00:12:24.970 with the likelihood of stroke or death,

NOTE Confidence: 0.878731831428571

00:12:24.970 --> 00:12:27.042 which you can see on the in

NOTE Confidence: 0.878731831428571

00:12:27.042 --> 00:12:28.749 the table on the right.

NOTE Confidence: 0.878731831428571

00:12:28.750 --> 00:12:31.788 You can see that the severity of

NOTE Confidence: 0.878731831428571

00:12:31.788 --> 00:12:35.790 sleep apnea is stratified with an

NOTE Confidence: 0.878731831428571

00:12:35.790 --> 00:12:39.150 increasing likelihood of association.

NOTE Confidence: 0.876184934090909

00:12:41.290 --> 00:12:44.394 And so this table from the same study

NOTE Confidence: 0.876184934090909

00:12:44.394 --> 00:12:46.738 shows the unadjusted and adjusted

NOTE Confidence: 0.876184934090909

00:12:46.738 --> 00:12:49.708 hazard ratios for the risk of

NOTE Confidence: 0.876184934090909

00:12:49.708 --> 00:12:52.201 stroke or death for all covariates.

NOTE Confidence: 0.876184934090909

00:12:52.201 --> 00:12:54.286 And in the unadjusted analysis,

NOTE Confidence: 0.876184934090909

00:12:54.290 --> 00:12:55.134 traditional cardiovascular

NOTE Confidence: 0.876184934090909

00:12:55.134 --> 00:12:57.666 risk factors that we think of,

NOTE Confidence: 0.876184934090909

00:12:57.670 --> 00:12:58.858 like age, diabetes,

NOTE Confidence: 0.876184934090909

00:12:58.858 --> 00:13:01.234 and hypertension were all associated with

NOTE Confidence: 0.876184934090909

00:13:01.234 --> 00:13:03.807 an increased risk of stroke or death.

NOTE Confidence: 0.876184934090909

00:13:03.810 --> 00:13:05.682 But what I'd like to draw your attention

NOTE Confidence: 0.876184934090909

00:13:05.682 --> 00:13:07.549 to is actually the bottom of the

NOTE Confidence: 0.876184934090909

00:13:07.549 --> 00:13:09.310 table where sleep apnea is listed,

NOTE Confidence: 0.876184934090909

00:13:09.310 --> 00:13:11.200 and the findings here show.

NOTE Confidence: 0.876184934090909

00:13:11.200 --> 00:13:16.430 Basically a doubling of risk.

NOTE Confidence: 0.876184934090909

00:13:16.430 --> 00:13:19.734 Of of stroke or death from any cause.

NOTE Confidence: 0.876184934090909

00:13:19.740 --> 00:13:21.485 And so this remains significant

NOTE Confidence: 0.876184934090909

00:13:21.485 --> 00:13:23.230 even after adjustment for all

NOTE Confidence: 0.876184934090909

00:13:23.293 --> 00:13:24.837 of the relevant covariates,

NOTE Confidence: 0.876184934090909

00:13:24.840 --> 00:13:28.170 which supports the hypothesis that sleep

NOTE Confidence: 0.876184934090909

00:13:28.170 --> 00:13:30.896 apnea independently increases the risk

NOTE Confidence: 0.876184934090909

00:13:30.896 --> 00:13:33.464 for stroke and all cause mortality.

NOTE Confidence: 0.876184934090909

00:13:33.470 --> 00:13:35.822 So this study was the really

NOTE Confidence: 0.876184934090909

00:13:35.822 --> 00:13:37.856 the first of its kind,

NOTE Confidence: 0.876184934090909

00:13:37.856 --> 00:13:40.186 but many subsequent studies have

NOTE Confidence: 0.876184934090909

00:13:40.186 --> 00:13:42.928 reproduced these results and and then

NOTE Confidence: 0.876184934090909

00:13:42.928 --> 00:13:45.346 gone on to also explore Physiology

NOTE Confidence: 0.876184934090909

00:13:45.346 --> 00:13:47.409 mechanisms and things like that,

NOTE Confidence: 0.876184934090909

00:13:47.410 --> 00:13:48.750 which we'll discuss shortly.

NOTE Confidence: 0.680691774285714

00:13:51.850 --> 00:13:54.678 Um, so under the mentorship of Clara,

NOTE Confidence: 0.680691774285714

00:13:54.680 --> 00:13:56.132 Yagi, and Kevin Chef.

NOTE Confidence: 0.680691774285714

00:13:56.132 --> 00:13:57.584 As I mentioned earlier,

NOTE Confidence: 0.680691774285714

00:13:57.590 --> 00:13:59.150 I studied the relationship

NOTE Confidence: 0.680691774285714

00:13:59.150 --> 00:14:01.100 between sleep apnea and NIH,

NOTE Confidence: 0.680691774285714

00:14:01.100 --> 00:14:04.040 specifically during fellowship.

NOTE Confidence: 0.680691774285714

00:14:04.040 --> 00:14:06.056 And I was really shocked to learn

NOTE Confidence: 0.680691774285714

00:14:06.056 --> 00:14:07.610 that so little research has

NOTE Confidence: 0.680691774285714

00:14:07.610 --> 00:14:09.500 been done in this sub domain.

NOTE Confidence: 0.680691774285714

00:14:09.500 --> 00:14:12.300 I still am sort of surprised but

NOTE Confidence: 0.680691774285714

00:14:12.300 --> 00:14:14.540 but it's it's a lucky break for me.

NOTE Confidence: 0.680691774285714

00:14:14.540 --> 00:14:17.726 And so utilizing a large case

NOTE Confidence: 0.680691774285714

00:14:17.726 --> 00:14:20.052 control data set that included

NOTE Confidence: 0.680691774285714

00:14:20.052 --> 00:14:22.740 3000 acute IH patients and 3000

NOTE Confidence: 0.680691774285714

00:14:22.825 --> 00:14:24.649 matched controls called the

NOTE Confidence: 0.680691774285714

00:14:24.649 --> 00:14:27.970 called Eric or the the Eric trial,

NOTE Confidence: 0.680691774285714

00:14:27.970 --> 00:14:32.389 all of all of the patients in both arms

NOTE Confidence: 0.680691774285714

00:14:32.389 --> 00:14:34.805 like 9098% of them had completed a Berlin.

NOTE Confidence: 0.680691774285714

00:14:34.810 --> 00:14:37.215 Questionnaire at the time of

NOTE Confidence: 0.680691774285714

00:14:37.215 --> 00:14:38.177 study enrollment,

NOTE Confidence: 0.680691774285714

00:14:38.180 --> 00:14:41.720 so we performed a cross-sectional analysis.

NOTE Confidence: 0.680691774285714

00:14:41.720 --> 00:14:45.780 And given that patients were enrolled within.

NOTE Confidence: 0.680691774285714

00:14:45.780 --> 00:14:48.877 Hours of their acute IH event we

NOTE Confidence: 0.680691774285714

00:14:48.877 --> 00:14:51.796 we made the leap that their ruling

NOTE Confidence: 0.680691774285714

00:14:51.796 --> 00:14:53.500 questionnaire should be reflective

NOTE Confidence: 0.680691774285714

00:14:53.500 --> 00:14:56.272 of their pre stroke status since not

NOTE Confidence: 0.680691774285714

00:14:56.272 --> 00:14:59.020 much time had passed and what we

NOTE Confidence: 0.680691774285714

00:14:59.020 --> 00:15:01.420 found is highlighted on this slide.

NOTE Confidence: 0.680691774285714

00:15:01.420 --> 00:15:04.129 So basically you can see that obstructive

NOTE Confidence: 0.680691774285714

00:15:04.129 --> 00:15:05.761 sleep apnea was significantly

NOTE Confidence: 0.680691774285714

00:15:05.761 --> 00:15:08.519 more common in those with ICH as

NOTE Confidence: 0.680691774285714

00:15:08.519 --> 00:15:10.539 compared to matched controls,

NOTE Confidence: 0.680691774285714

00:15:10.540 --> 00:15:12.454 and that this finding held even

NOTE Confidence: 0.680691774285714

00:15:12.454 --> 00:15:14.349 after we adjusted for significant

NOTE Confidence: 0.680691774285714

00:15:14.349 --> 00:15:16.020 covariates and universal.

NOTE Confidence: 0.680691774285714

00:15:16.020 --> 00:15:18.330 Founders.

NOTE Confidence: 0.680691774285714

00:15:18.330 --> 00:15:21.081 We also did some special analysis because

NOTE Confidence: 0.680691774285714

00:15:21.081 --> 00:15:24.310 as many of you are probably thinking,

NOTE Confidence: 0.680691774285714

00:15:24.310 --> 00:15:25.650 we too were thinking that,

NOTE Confidence: 0.680691774285714

00:15:25.650 --> 00:15:29.028 you know, hypertension is a really

NOTE Confidence: 0.680691774285714

00:15:29.030 --> 00:15:31.350 important risk factor for IH,

NOTE Confidence: 0.680691774285714

00:15:31.350 --> 00:15:34.212 potentially more so even than than

NOTE Confidence: 0.680691774285714

00:15:34.212 --> 00:15:36.610 schimick stroke and it's also,

NOTE Confidence: 0.680691774285714

00:15:36.610 --> 00:15:38.668 you know, associated with sleep apnea.

NOTE Confidence: 0.680691774285714

00:15:38.670 --> 00:15:39.886 So we,

NOTE Confidence: 0.680691774285714

00:15:39.886 --> 00:15:42.926 we perform some additional analysis

NOTE Confidence: 0.680691774285714

00:15:42.930 --> 00:15:45.306 to kind of investigate this further.

NOTE Confidence: 0.680691774285714

00:15:45.310 --> 00:15:48.290 So first of all.

NOTE Confidence: 0.680691774285714

00:15:48.290 --> 00:15:50.649 There I should mention that there are

NOTE Confidence: 0.680691774285714

00:15:50.649 --> 00:15:53.377 sort of two bucket locations for IH.

NOTE Confidence: 0.680691774285714

00:15:53.380 --> 00:15:54.732 There's non low bar,

NOTE Confidence: 0.680691774285714

00:15:54.732 --> 00:15:56.760 which is usually due to hypertension

NOTE Confidence: 0.680691774285714

00:15:56.819 --> 00:15:59.235 and then there's low bar which is more

NOTE Confidence: 0.680691774285714

00:15:59.235 --> 00:16:01.738 commonly due to cerebral amyloid angiopathy.

NOTE Confidence: 0.680691774285714

00:16:01.740 --> 00:16:04.458 And so we stratified our results

NOTE Confidence: 0.680691774285714

00:16:04.458 --> 00:16:07.286 by location and found that this

NOTE Confidence: 0.680691774285714

00:16:07.286 --> 00:16:09.596 that that our initial finding

NOTE Confidence: 0.680691774285714

00:16:09.596 --> 00:16:11.317 held regardless of location,

NOTE Confidence: 0.680691774285714

00:16:11.317 --> 00:16:13.831 IE even for low bar strokes

NOTE Confidence: 0.680691774285714

00:16:13.831 --> 00:16:16.608 which were presumably not due to

NOTE Confidence: 0.680691774285714

00:16:16.608 --> 00:16:18.888 hypertension as the primary driver.

NOTE Confidence: 0.680691774285714

00:16:18.890 --> 00:16:21.179 And we also did a hypertension focused

NOTE Confidence: 0.680691774285714

00:16:21.179 --> 00:16:22.889 analysis which supported our findings.

NOTE Confidence: 0.92354954

00:16:26.730 --> 00:16:29.406 So now that we've gone through

NOTE Confidence: 0.92354954

00:16:29.410 --> 00:16:31.132 a review of sort of evidence

NOTE Confidence: 0.92354954

00:16:31.132 --> 00:16:32.730 linking sleep apnea and stroke,

NOTE Confidence: 0.92354954

00:16:32.730 --> 00:16:36.330 I'd like to spend the the next several

NOTE Confidence: 0.92354954

00:16:36.330 --> 00:16:39.410 minutes talking about proposed mechanisms

NOTE Confidence: 0.92354954

00:16:39.410 --> 00:16:41.708 for how sleep apnea causes stroke.

NOTE Confidence: 0.835884995043478

00:16:44.390 --> 00:16:47.150 And I realize this is a very busy

NOTE Confidence: 0.835884995043478

00:16:47.150 --> 00:16:49.711 slide with a lot of words and I'm

NOTE Confidence: 0.835884995043478

00:16:49.711 --> 00:16:52.320 not going to go through them all.

NOTE Confidence: 0.835884995043478

00:16:52.320 --> 00:16:54.534 So that's a sort of more

NOTE Confidence: 0.835884995043478

00:16:54.534 --> 00:16:56.960 to to show you all this,

NOTE Confidence: 0.835884995043478

00:16:56.960 --> 00:17:00.304 this web of interconnection

NOTE Confidence: 0.835884995043478

00:17:00.304 --> 00:17:03.592 among risk factors and outcomes.

NOTE Confidence: 0.835884995043478

00:17:03.592 --> 00:17:08.156 And I will distill it down in the

NOTE Confidence: 0.835884995043478

00:17:08.156 --> 00:17:11.182 end to to six mechanisms that I'd

NOTE Confidence: 0.835884995043478

00:17:11.182 --> 00:17:13.818 like to discuss today, but I.

NOTE Confidence: 0.835884995043478

00:17:13.818 --> 00:17:16.121 I just want to sort of highlight

NOTE Confidence: 0.835884995043478

00:17:16.121 --> 00:17:18.377 that the physiologic sick quality

NOTE Confidence: 0.835884995043478

00:17:18.377 --> 00:17:21.155 of of obstructive sleep apnea can

NOTE Confidence: 0.835884995043478

00:17:21.235 --> 00:17:23.910 lead to these chronic downstream

NOTE Confidence: 0.835884995043478

00:17:23.910 --> 00:17:26.394 mechanisms of atherosclerosis,

NOTE Confidence: 0.835884995043478

00:17:26.394 --> 00:17:28.338 including inflammation,

NOTE Confidence: 0.835884995043478

00:17:28.338 --> 00:17:29.310 hypertension,

NOTE Confidence: 0.835884995043478

00:17:29.310 --> 00:17:31.650 impaired glucose metabolism

NOTE Confidence: 0.835884995043478

00:17:31.650 --> 00:17:34.770 and snoring related vibration.

NOTE Confidence: 0.835884995043478

00:17:34.770 --> 00:17:37.485 And then there are additional

NOTE Confidence: 0.835884995043478

00:17:37.485 --> 00:17:40.200 physiologic stresses related to sleep

NOTE Confidence: 0.835884995043478

00:17:40.285 --> 00:17:42.206 apnea which can also predispose

NOTE Confidence: 0.835884995043478

00:17:42.206 --> 00:17:44.480 to stroke and sort of potentiate.

NOTE Confidence: 0.835884995043478

00:17:44.480 --> 00:17:46.490 A lot of these other mechanisms,

NOTE Confidence: 0.835884995043478

00:17:46.490 --> 00:17:48.878 and these include.

NOTE Confidence: 0.835884995043478

00:17:48.880 --> 00:17:52.336 Acute decreases in cerebral blood flow,

NOTE Confidence: 0.835884995043478

00:17:52.340 --> 00:17:54.660 a heightened risk of Afib,

NOTE Confidence: 0.835884995043478

00:17:54.660 --> 00:17:57.560 induced cardio embolic stroke,

NOTE Confidence: 0.835884995043478

00:17:57.560 --> 00:18:00.460 paradoxical embolism through PFOA,

NOTE Confidence: 0.835884995043478

00:18:00.460 --> 00:18:02.560 which happens to be much more

NOTE Confidence: 0.835884995043478

00:18:02.560 --> 00:18:05.162 common in in people with sleep apnea

NOTE Confidence: 0.835884995043478

00:18:05.162 --> 00:18:06.716 than than the general population.

NOTE Confidence: 0.835884995043478

00:18:06.716 --> 00:18:08.480 And so we'll spend the next

NOTE Confidence: 0.835884995043478

00:18:08.539 --> 00:18:10.314 several minutes kind of delving

NOTE Confidence: 0.835884995043478

00:18:10.314 --> 00:18:11.379 into these mechanisms.

NOTE Confidence: 0.770005927857143

00:18:15.460 --> 00:18:17.600 So the six mechanisms I'd

NOTE Confidence: 0.770005927857143

00:18:17.600 --> 00:18:19.740 like to highlight for today's

NOTE Confidence: 0.770005927857143

00:18:19.823 --> 00:18:22.159 talk are intermittent hypoxia,

NOTE Confidence: 0.770005927857143

00:18:22.160 --> 00:18:23.656 sympathetic activation,

NOTE Confidence: 0.770005927857143

00:18:23.656 --> 00:18:26.648 metabolic dysfunction, snoring and

NOTE Confidence: 0.770005927857143

00:18:26.648 --> 00:18:29.640 vibration induced carotid disease,

NOTE Confidence: 0.770005927857143

00:18:29.640 --> 00:18:31.692 arrhythmia and cardioembolic stroke,

NOTE Confidence: 0.770005927857143

00:18:31.692 --> 00:18:34.257 and PFOA and paradoxical embolism.

NOTE Confidence: 0.770005927857143

00:18:34.260 --> 00:18:37.158 And all of these mechanisms have

NOTE Confidence: 0.770005927857143

00:18:37.158 --> 00:18:39.513 been extensively studied and and

NOTE Confidence: 0.770005927857143

00:18:39.513 --> 00:18:41.605 have been shown to have a direct

NOTE Confidence: 0.770005927857143

00:18:41.605 --> 00:18:43.010 causal effect on the pathway

NOTE Confidence: 0.770005927857143

00:18:43.069 --> 00:18:44.779 between sleep apnea and stroke.

NOTE Confidence: 0.808705587142857

00:18:49.410 --> 00:18:51.490 So the first mechanism

NOTE Confidence: 0.808705587142857

00:18:51.490 --> 00:18:53.050 is intermittent hypoxia.

NOTE Confidence: 0.808705587142857

00:18:53.050 --> 00:18:55.555 So sleep apnea results in

NOTE Confidence: 0.808705587142857

00:18:55.555 --> 00:18:57.559 repetitive episodes of hypoxia

NOTE Confidence: 0.808705587142857

00:18:57.559 --> 00:19:00.337 and the varying severity and

NOTE Confidence: 0.808705587142857

00:19:00.337 --> 00:19:03.072 duration all throughout the night.

NOTE Confidence: 0.808705587142857

00:19:03.080 --> 00:19:06.455 This intermittent hypoxia and has

NOTE Confidence: 0.808705587142857

00:19:06.455 --> 00:19:09.911 been shown to lead to generation

NOTE Confidence: 0.808705587142857

00:19:09.911 --> 00:19:11.819 of reactive oxygen species,

NOTE Confidence: 0.808705587142857

00:19:11.820 --> 00:19:13.716 activation of transcription

NOTE Confidence: 0.808705587142857

00:19:13.716 --> 00:19:16.876 factor and release of cytokine

NOTE Confidence: 0.808705587142857

00:19:16.876 --> 00:19:19.120 and adhesion molecules.

NOTE Confidence: 0.808705587142857

00:19:19.120 --> 00:19:21.265 And this ultimately results in

NOTE Confidence: 0.808705587142857

00:19:21.265 --> 00:19:22.981 endothelial dysfunction and the

NOTE Confidence: 0.808705587142857

00:19:22.981 --> 00:19:24.580 development of atherosclerosis.

NOTE Confidence: 0.851009577066666

00:19:26.800 --> 00:19:29.392 So as our barzman and colleagues

NOTE Confidence: 0.851009577066666

00:19:29.392 --> 00:19:31.639 conducted an interesting and relevant

NOTE Confidence: 0.851009577066666

00:19:31.639 --> 00:19:34.712 study a few years ago looking at

NOTE Confidence: 0.851009577066666

00:19:34.712 --> 00:19:36.777 outcome implications of the hypoxic

NOTE Confidence: 0.851009577066666

00:19:36.777 --> 00:19:38.991 burden and they were able to

NOTE Confidence: 0.851009577066666

00:19:38.991 --> 00:19:41.360 actually quantify the hypoxic burden.

NOTE Confidence: 0.851009577066666

00:19:41.360 --> 00:19:45.090 And so, given that that HIV poorly

NOTE Confidence: 0.851009577066666

00:19:45.090 --> 00:19:47.752 predicts outcomes in sleep apnea,

NOTE Confidence: 0.851009577066666

00:19:47.752 --> 00:19:50.392 the authors thought that maybe

NOTE Confidence: 0.851009577066666

00:19:50.392 --> 00:19:52.883 quantification of the actual burden of

NOTE Confidence: 0.851009577066666

00:19:52.883 --> 00:19:56.035 hypoxia and including sort of depth and

NOTE Confidence: 0.851009577066666

00:19:56.035 --> 00:19:58.430 duration metrics would more accurately

NOTE Confidence: 0.851009577066666

00:19:58.503 --> 00:20:01.052 correlate with adverse cardiovascular

NOTE Confidence: 0.851009577066666

00:20:01.052 --> 00:20:03.908 and cerebrovascular outcomes.

NOTE Confidence: 0.851009577066666

00:20:03.910 --> 00:20:06.780 So they use two very large cohorts

NOTE Confidence: 0.851009577066666

00:20:06.780 --> 00:20:08.010 of older adults.

NOTE Confidence: 0.851009577066666

00:20:08.010 --> 00:20:10.224 They use the outcomes of sleep

NOTE Confidence: 0.851009577066666

00:20:10.224 --> 00:20:12.595 disorders in older men cohort and

NOTE Confidence: 0.851009577066666

00:20:12.595 --> 00:20:14.635 the sleep heart health cohort.

NOTE Confidence: 0.851009577066666

00:20:14.640 --> 00:20:17.916 And they measured hypoxic burden as the

NOTE Confidence: 0.851009577066666

00:20:17.920 --> 00:20:20.968 respiratory event associated associated

NOTE Confidence: 0.851009577066666

00:20:20.968 --> 00:20:24.778 area under the desaturation curve.

NOTE Confidence: 0.851009577066666

00:20:24.780 --> 00:20:26.760 And they compared this curve

NOTE Confidence: 0.851009577066666

00:20:26.760 --> 00:20:28.740 with the pre event baseline.

NOTE Confidence: 0.851009577066666

00:20:28.740 --> 00:20:31.204 So in the figure from this paper on

NOTE Confidence: 0.851009577066666

00:20:31.204 --> 00:20:34.161 the left you can see an example of

NOTE Confidence: 0.851009577066666

00:20:34.161 --> 00:20:36.131 this calculation with Apneas recorded

NOTE Confidence: 0.851009577066666

00:20:36.131 --> 00:20:38.826 on the top and oxygen saturation on

NOTE Confidence: 0.851009577066666

00:20:38.826 --> 00:20:42.096 the bottom with time on the X axis.

NOTE Confidence: 0.851009577066666

00:20:42.100 --> 00:20:44.949 And the figure on the right is

NOTE Confidence: 0.851009577066666

00:20:44.949 --> 00:20:48.859 from the same study and it shows

NOTE Confidence: 0.851009577066666

00:20:48.859 --> 00:20:51.451 adjusted survival for cardiovascular

NOTE Confidence: 0.851009577066666

00:20:51.451 --> 00:20:53.490 more mortality across.

NOTE Confidence: 0.851009577066666

00:20:53.490 --> 00:20:58.880 Each severity category of hypoxic burden.

NOTE Confidence: 0.851009577066666

00:20:58.880 --> 00:21:03.620 And they did a nice accurate rainbow

NOTE Confidence: 0.851009577066666

00:21:03.620 --> 00:21:06.068 for for different severities.

NOTE Confidence: 0.851009577066666

00:21:06.068 --> 00:21:09.164 So you can you can see here with the X

NOTE Confidence: 0.851009577066666

00:21:09.164 --> 00:21:11.877 axis showing time and years and the Y

NOTE Confidence: 0.851009577066666

00:21:11.877 --> 00:21:13.911 axis I'm showing survival probability

NOTE Confidence: 0.851009577066666

00:21:13.911 --> 00:21:16.755 that the worse the hypoxic burden,

NOTE Confidence: 0.851009577066666

00:21:16.760 --> 00:21:18.328 the shorter the survival.

NOTE Confidence: 0.816819804923077

00:21:23.610 --> 00:21:25.575 The next mechanism by which

NOTE Confidence: 0.816819804923077

00:21:25.575 --> 00:21:27.147 sleep apnea increases stroke

NOTE Confidence: 0.816819804923077

00:21:27.147 --> 00:21:29.289 risk is sympathetic activation,

NOTE Confidence: 0.816819804923077

00:21:29.290 --> 00:21:32.216 and this figure on seeing here on

NOTE Confidence: 0.816819804923077

00:21:32.216 --> 00:21:36.234 this slide is a nice depiction of a

NOTE Confidence: 0.816819804923077

00:21:36.234 --> 00:21:38.578 representative cut from nocturnal monitoring.

NOTE Confidence: 0.816819804923077

00:21:38.578 --> 00:21:42.750 But you can see that there's a spike in

NOTE Confidence: 0.816819804923077

00:21:42.750 --> 00:21:45.510 sympathetic nerve activity with each apnea,

NOTE Confidence: 0.816819804923077

00:21:45.510 --> 00:21:48.036 and a corresponding surge in blood

NOTE Confidence: 0.816819804923077

00:21:48.036 --> 00:21:50.748 pressure at the termination of each apnea.

NOTE Confidence: 0.816819804923077

00:21:50.750 --> 00:21:54.098 And so this finding is reproducible

NOTE Confidence: 0.816819804923077

00:21:54.098 --> 00:21:56.330 basically with each apnea.

NOTE Confidence: 0.816819804923077

00:21:56.330 --> 00:21:59.015 And so it's happening presumably

NOTE Confidence: 0.816819804923077

00:21:59.015 --> 00:22:02.509 hundreds of times per night and more

NOTE Confidence: 0.816819804923077

00:22:02.510 --> 00:22:05.588 with increasing severity of sleep apnea.

NOTE Confidence: 0.816819804923077

00:22:05.590 --> 00:22:08.166 And so this is thought at least in

NOTE Confidence: 0.816819804923077

00:22:08.166 --> 00:22:11.437 part to be due to a resetting of

NOTE Confidence: 0.816819804923077

00:22:11.437 --> 00:22:13.179 baroreceptor sensitivity during sleep

NOTE Confidence: 0.816819804923077

00:22:13.179 --> 00:22:15.567 in patients who have sleep apnea.

NOTE Confidence: 0.816819804923077

00:22:15.570 --> 00:22:18.726 And this finding is most pronounced

NOTE Confidence: 0.816819804923077

00:22:18.726 --> 00:22:21.560 in end to sleep. Random sleep.

NOTE Confidence: 0.83486549

00:22:24.360 --> 00:22:27.124 Interestingly, this phenomenon of

NOTE Confidence: 0.83486549

00:22:27.124 --> 00:22:29.888 of increased sympathetic activation

NOTE Confidence: 0.83486549

00:22:29.888 --> 00:22:33.758 can also be seen during wakefulness.

NOTE Confidence: 0.83486549

00:22:33.760 --> 00:22:36.259 And so in an older but excellent

NOTE Confidence: 0.83486549

00:22:36.259 --> 00:22:38.918 Physiology study by summer and colleagues,

NOTE Confidence: 0.83486549

00:22:38.920 --> 00:22:41.695 the authors demonstrated that this

NOTE Confidence: 0.83486549

00:22:41.695 --> 00:22:43.915 sympathetic nerve activity actually

NOTE Confidence: 0.83486549

00:22:43.915 --> 00:22:46.070 persists during wakefulness in

NOTE Confidence: 0.83486549

00:22:46.070 --> 00:22:48.615 people with obstructive sleep apnea.

NOTE Confidence: 0.83486549

00:22:48.620 --> 00:22:52.380 And so here you can see on nerve

NOTE Confidence: 0.83486549

00:22:52.380 --> 00:22:55.270 tone tracings in awake subjects.

NOTE Confidence: 0.83486549

00:22:55.270 --> 00:22:57.785 Normal, meaning no sleep apnea

NOTE Confidence: 0.83486549

00:22:57.785 --> 00:23:00.805 and OSA in patients with sleep

NOTE Confidence: 0.83486549

00:23:00.805 --> 00:23:03.235 apnea and so on the left,

NOTE Confidence: 0.83486549

00:23:03.240 --> 00:23:05.142 you can see that there's lower

NOTE Confidence: 0.83486549

00:23:05.142 --> 00:23:07.130 lower tone than on the right,

NOTE Confidence: 0.83486549

00:23:07.130 --> 00:23:09.958 and this is again an awake patient.

NOTE Confidence: 0.83486549

00:23:09.960 --> 00:23:12.488 And so very clearly,

NOTE Confidence: 0.83486549

00:23:12.488 --> 00:23:15.016 this propensity towards heightened

NOTE Confidence: 0.83486549

00:23:15.016 --> 00:23:17.279 sympathetic activity is actually

NOTE Confidence: 0.83486549

00:23:17.280 --> 00:23:20.955 not just limited to when when these

NOTE Confidence: 0.83486549

00:23:20.960 --> 00:23:22.840 sleep apnea patients are sleeping,

NOTE Confidence: 0.83486549

00:23:22.840 --> 00:23:24.980 but also throughout the day,

NOTE Confidence: 0.83486549

00:23:24.980 --> 00:23:26.708 which increases risk further.

NOTE Confidence: 0.874628966666667

00:23:31.520 --> 00:23:34.796 So moving on to mechanism 3,

NOTE Confidence: 0.874628966666667

00:23:34.800 --> 00:23:37.295 I will talk about metabolic

NOTE Confidence: 0.874628966666667

00:23:37.295 --> 00:23:39.291 dysfunction and I'd specifically

NOTE Confidence: 0.874628966666667

00:23:39.291 --> 00:23:41.937 like to focus on type 2 diabetes

NOTE Confidence: 0.874628966666667

00:23:41.940 --> 00:23:44.890 in patients with sleep apnea.

NOTE Confidence: 0.874628966666667

00:23:44.890 --> 00:23:47.380 So this is relevant because

NOTE Confidence: 0.874628966666667

00:23:47.380 --> 00:23:50.563 diabetes on its own is actually

NOTE Confidence: 0.874628966666667

00:23:50.563 --> 00:23:54.067 a potent risk factor for stroke,

NOTE Confidence: 0.874628966666667

00:23:54.070 --> 00:23:56.818 but OSA is also an independent

NOTE Confidence: 0.874628966666667

00:23:56.818 --> 00:23:58.650 risk factor for diabetes,

NOTE Confidence: 0.874628966666667

00:23:58.650 --> 00:24:02.005 even after adjustment for confounders

NOTE Confidence: 0.874628966666667

00:24:02.005 --> 00:24:04.208 like BMI and weight gain.

NOTE Confidence: 0.91266178625

00:24:06.900 --> 00:24:09.468 So this table here on the right is

NOTE Confidence: 0.91266178625

00:24:09.468 --> 00:24:11.793 from an observational cohort study

NOTE Confidence: 0.91266178625

00:24:11.793 --> 00:24:14.750 where over 1200 veterans in the

NOTE Confidence: 0.91266178625

00:24:14.750 --> 00:24:17.450 VA system were evaluated for sleep

NOTE Confidence: 0.91266178625

00:24:17.450 --> 00:24:19.512 disordered breathing and surprisingly

NOTE Confidence: 0.91266178625

00:24:19.512 --> 00:24:22.564 about half did not have diabetes at

NOTE Confidence: 0.91266178625

00:24:22.564 --> 00:24:25.575 the time of the of study enrollment.

NOTE Confidence: 0.91266178625

00:24:25.580 --> 00:24:28.373 And so these folks went on to

NOTE Confidence: 0.91266178625

00:24:28.373 --> 00:24:31.385 complete a full PSG and the study

NOTE Confidence: 0.91266178625

00:24:31.385 --> 00:24:33.810 population was divided into quartiles

NOTE Confidence: 0.91266178625

00:24:33.810 --> 00:24:36.887 based on sleep apnea severity and.

NOTE Confidence: 0.91266178625

00:24:36.890 --> 00:24:39.615 The main outcome of interest

NOTE Confidence: 0.91266178625

00:24:39.615 --> 00:24:41.250 was incident diabetes.

NOTE Confidence: 0.91266178625

00:24:41.250 --> 00:24:43.974 So their initial analysis looking at

NOTE Confidence: 0.91266178625

00:24:43.974 --> 00:24:46.511 linear Trend showed a significantly

NOTE Confidence: 0.91266178625

00:24:46.511 --> 00:24:50.163 increased risk of incident diabetes as

NOTE Confidence: 0.91266178625

00:24:50.163 --> 00:24:53.334 a function of severity of sleep apnea.

NOTE Confidence: 0.91266178625

00:24:53.340 --> 00:24:55.257 And as you can see here in the table,

NOTE Confidence: 0.91266178625

00:24:55.260 --> 00:24:57.540 sleep apnea was associated with diabetes,

NOTE Confidence: 0.91266178625

00:24:57.540 --> 00:25:02.456 even after adjustment for age, race,

NOTE Confidence: 0.91266178625

00:25:02.456 --> 00:25:06.215 gender, and baseline fasting glucose, BMI,

NOTE Confidence: 0.91266178625

00:25:06.215 --> 00:25:08.690 as well as weight gain or change in BMI.

NOTE Confidence: 0.890941775454546

00:25:12.500 --> 00:25:14.435 And mechanisms through which sleep

NOTE Confidence: 0.890941775454546

00:25:14.435 --> 00:25:16.868 apnea is implicated in the development

NOTE Confidence: 0.890941775454546

00:25:16.868 --> 00:25:19.454 of type 2 diabetes include activation

NOTE Confidence: 0.890941775454546

00:25:19.454 --> 00:25:21.770 of the sympathetic nervous system,

NOTE Confidence: 0.890941775454546

00:25:21.770 --> 00:25:24.812 which we just discussed because sympathetic

NOTE Confidence: 0.890941775454546

00:25:24.812 --> 00:25:27.594 nervous system activity plays a key role

NOTE Confidence: 0.890941775454546

00:25:27.594 --> 00:25:30.324 in regulation of glucose metabolism.

NOTE Confidence: 0.890941775454546

00:25:30.324 --> 00:25:33.454 Another mechanism is oxidative stress,

NOTE Confidence: 0.890941775454546

00:25:33.460 --> 00:25:36.005 where sleep apnea may accelerate

NOTE Confidence: 0.890941775454546

00:25:36.005 --> 00:25:38.550 progression to type 2 diabetes.

NOTE Confidence: 0.890941775454546

00:25:38.550 --> 00:25:42.326 1/3 mechanism is subclinical

NOTE Confidence: 0.890941775454546

00:25:42.326 --> 00:25:45.334 inflammation and adipocyte derived

NOTE Confidence: 0.890941775454546

00:25:45.334 --> 00:25:48.086 inflammatory factors like I6,

NOTE Confidence: 0.890941775454546

00:25:48.090 --> 00:25:50.465 which have been well established

NOTE Confidence: 0.890941775454546

00:25:50.465 --> 00:25:53.580 mediators in the pathogenesis of diabetes.

NOTE Confidence: 0.890941775454546

00:25:53.580 --> 00:25:55.398 And systemic inflammation

NOTE Confidence: 0.890941775454546

00:25:55.398 --> 00:25:57.216 and cytokine production,

NOTE Confidence: 0.890941775454546

00:25:57.220 --> 00:25:59.520 which are augmented by sleep

NOTE Confidence: 0.890941775454546

00:25:59.520 --> 00:26:01.360 loss or sleep deficit,

NOTE Confidence: 0.890941775454546

00:26:01.360 --> 00:26:04.335 can also hasten the progression to diabetes.

NOTE Confidence: 0.890941775454546

00:26:04.340 --> 00:26:05.270 And then finally,

NOTE Confidence: 0.890941775454546

00:26:05.270 --> 00:26:07.440 it it seems in in more recent

NOTE Confidence: 0.890941775454546

00:26:07.510 --> 00:26:10.120 literature that OSA in pregnancy has

NOTE Confidence: 0.890941775454546

00:26:10.120 --> 00:26:12.515 actually been associated with insulin

NOTE Confidence: 0.890941775454546

00:26:12.515 --> 00:26:14.839 resistance and gestational diabetes,

NOTE Confidence: 0.890941775454546

00:26:14.840 --> 00:26:17.536 and this is an area of active research.

NOTE Confidence: 0.689443504

00:26:22.320 --> 00:26:27.040 So the 4th mechanism is one that I I think

NOTE Confidence: 0.689443504

00:26:27.040 --> 00:26:29.960 is kind of fun because it's so intuitive.

NOTE Confidence: 0.689443504

00:26:29.960 --> 00:26:33.072 So snoring and vibration

NOTE Confidence: 0.689443504

00:26:33.072 --> 00:26:35.406 induced carotid disease.

NOTE Confidence: 0.689443504

00:26:35.410 --> 00:26:38.845 So basically the direct effect

NOTE Confidence: 0.689443504

00:26:38.845 --> 00:26:43.390 of of snores on the local carotid

NOTE Confidence: 0.689443504

00:26:43.390 --> 00:26:45.037 artery causing disease.

NOTE Confidence: 0.689443504

00:26:45.037 --> 00:26:47.479 So the effect is not limited

NOTE Confidence: 0.689443504

00:26:47.479 --> 00:26:50.119 just to people with sleep apnea,

NOTE Confidence: 0.689443504

00:26:50.120 --> 00:26:53.004 because anyone who snores is at risk,

NOTE Confidence: 0.689443504

00:26:53.010 --> 00:26:54.690 but since almost everyone

NOTE Confidence: 0.689443504

00:26:54.690 --> 00:26:56.370 with sleep apnea snores,

NOTE Confidence: 0.689443504

00:26:56.370 --> 00:26:59.000 it is irrelevant risk factor.

NOTE Confidence: 0.689443504

00:26:59.000 --> 00:27:01.576 So snores originate in the upper airway.

NOTE Confidence: 0.689443504

00:27:01.580 --> 00:27:03.950 They cause vibration of the

NOTE Confidence: 0.689443504

00:27:03.950 --> 00:27:06.320 pharyngeal wall and local structures

NOTE Confidence: 0.689443504

00:27:06.320 --> 00:27:09.188 which are all near the carotid.

NOTE Confidence: 0.689443504

00:27:09.190 --> 00:27:11.638 And then over time when the

NOTE Confidence: 0.689443504

00:27:11.638 --> 00:27:12.862 carotid endothelium continuously

NOTE Confidence: 0.689443504

00:27:12.862 --> 00:27:15.027 is exposed to this vibration,

NOTE Confidence: 0.689443504

00:27:15.030 --> 00:27:19.086 it can become damaged and atherosclerotic.

NOTE Confidence: 0.689443504

00:27:19.090 --> 00:27:20.450 The evidence to support this

NOTE Confidence: 0.689443504

00:27:20.450 --> 00:27:22.330 comes from a lot of studies,

NOTE Confidence: 0.689443504

00:27:22.330 --> 00:27:24.790 but one particular study of

NOTE Confidence: 0.689443504

00:27:24.790 --> 00:27:27.798 interest by Lee and colleagues is

NOTE Confidence: 0.689443504

00:27:27.798 --> 00:27:29.990 noteworthy because they compared

NOTE Confidence: 0.689443504

00:27:29.990 --> 00:27:32.120 carotid and femoral arteries and

NOTE Confidence: 0.689443504

00:27:32.120 --> 00:27:34.990 snores and found that the carotids,

NOTE Confidence: 0.689443504

00:27:34.990 --> 00:27:38.182 which are directly affected by snoring

NOTE Confidence: 0.689443504

00:27:38.182 --> 00:27:40.310 vibration had higher atherosclerosis

NOTE Confidence: 0.689443504

00:27:40.387 --> 00:27:42.727 burden than the femoral arteries.

NOTE Confidence: 0.689443504

00:27:42.730 --> 00:27:44.512 And as you can see here on the slide,

NOTE Confidence: 0.689443504

00:27:44.520 --> 00:27:47.089 the Audrey ratio was was 10 even

NOTE Confidence: 0.689443504

00:27:47.089 --> 00:27:48.890 after adjustment for relevant.

NOTE Confidence: 0.689443504

00:27:48.890 --> 00:27:51.020 Variables.

NOTE Confidence: 0.689443504

00:27:51.020 --> 00:27:53.052 It's also worth mentioning

NOTE Confidence: 0.689443504

00:27:53.052 --> 00:27:55.592 that in the SAVE trial,

NOTE Confidence: 0.689443504

00:27:55.600 --> 00:27:57.960 they did evaluate self reported

NOTE Confidence: 0.689443504

00:27:57.960 --> 00:28:00.789 snoring patterns and stroke events in

NOTE Confidence: 0.689443504

00:28:00.789 --> 00:28:03.177 high risk patients with sleep apnea,

NOTE Confidence: 0.689443504

00:28:03.180 --> 00:28:05.180 and the authors observed that

NOTE Confidence: 0.689443504

00:28:05.180 --> 00:28:07.180 among the sleep apnea patients,

NOTE Confidence: 0.689443504

00:28:07.180 --> 00:28:08.500 increased frequency,

NOTE Confidence: 0.689443504

00:28:08.500 --> 00:28:10.480 self reported frequency,

NOTE Confidence: 0.689443504

00:28:10.480 --> 00:28:12.520 and loudness of snoring was

NOTE Confidence: 0.689443504

00:28:12.520 --> 00:28:14.152 associated with greater risk

NOTE Confidence: 0.689443504

00:28:14.152 --> 00:28:16.219 of cerebrovascular events.

NOTE Confidence: 0.23640487

00:28:22.060 --> 00:28:25.586 So. Mechanism 5,

NOTE Confidence: 0.23640487

00:28:25.586 --> 00:28:29.826 arrhythmia and cardioembolic stroke on.

NOTE Confidence: 0.23640487

00:28:29.830 --> 00:28:32.206 So we often jump to Afib as the

NOTE Confidence: 0.23640487

00:28:32.206 --> 00:28:34.769 the the main arrhythmia that we

NOTE Confidence: 0.23640487

00:28:34.769 --> 00:28:37.601 associate with sleep apnea and stroke.

NOTE Confidence: 0.23640487

00:28:37.610 --> 00:28:40.550 But sleep apnea is in fact linked

NOTE Confidence: 0.23640487

00:28:40.550 --> 00:28:44.130 with higher risk of many arrhythmias.

NOTE Confidence: 0.23640487

00:28:44.130 --> 00:28:46.150 So Mara and colleagues compared

NOTE Confidence: 0.23640487

00:28:46.150 --> 00:28:48.170 the prevalence of arrhythmias in

NOTE Confidence: 0.23640487

00:28:48.235 --> 00:28:50.190 two samples of participants from

NOTE Confidence: 0.23640487

00:28:50.190 --> 00:28:52.145 the sleep Heart health study,

NOTE Confidence: 0.23640487

00:28:52.150 --> 00:28:56.610 matched for age, sex, BMI,

NOTE Confidence: 0.23640487

00:28:56.610 --> 00:28:58.766 and race and ethnicity.

NOTE Confidence: 0.23640487

00:28:58.766 --> 00:29:01.461 And they found that among

NOTE Confidence: 0.23640487

00:29:01.461 --> 00:29:03.768 those with sleep apnea,

NOTE Confidence: 0.23640487

00:29:03.770 --> 00:29:06.008 which for the purposes of the

NOTE Confidence: 0.23640487

00:29:06.008 --> 00:29:08.500 study was defined as an RDI of

NOTE Confidence: 0.23640487

00:29:08.500 --> 00:29:10.810 greater than or equal to 30,

NOTE Confidence: 0.23640487

00:29:10.810 --> 00:29:14.278 and that there was a significantly

NOTE Confidence: 0.23640487

00:29:14.278 --> 00:29:16.590 higher rate of arrhythmia.

NOTE Confidence: 0.23640487

00:29:16.590 --> 00:29:19.870 And and not just A-fib.

NOTE Confidence: 0.23640487

00:29:19.870 --> 00:29:21.144 So in the figure on the left,

NOTE Confidence: 0.23640487

00:29:21.150 --> 00:29:23.325 you can see various arrhythmias

NOTE Confidence: 0.23640487

00:29:23.325 --> 00:29:25.500 listed on the X axis,

NOTE Confidence: 0.23640487

00:29:25.500 --> 00:29:28.344 with the Gray bars representing the

NOTE Confidence: 0.23640487

00:29:28.344 --> 00:29:31.716 those with sleep apnea and the white

NOTE Confidence: 0.23640487

00:29:31.716 --> 00:29:34.494 bars on patients without sleep apnea.

NOTE Confidence: 0.23640487

00:29:34.500 --> 00:29:37.944 And you can nicely see that all

NOTE Confidence: 0.23640487

00:29:37.944 --> 00:29:40.679 arrhythmias noted have vastly higher

NOTE Confidence: 0.23640487

00:29:40.679 --> 00:29:44.165 prevalence in the sleep apnea cohort.

NOTE Confidence: 0.23640487

00:29:44.170 --> 00:29:45.578 And on the right,

NOTE Confidence: 0.23640487

00:29:45.578 --> 00:29:48.748 you can see a table from the same

NOTE Confidence: 0.23640487

00:29:48.748 --> 00:29:51.664 study and looking at adjusted and

NOTE Confidence: 0.23640487

00:29:51.664 --> 00:29:53.945 unadjusted odds ratios really

NOTE Confidence: 0.23640487

00:29:53.945 --> 00:29:57.000 relating arrhythmia with sleep apnea.

NOTE Confidence: 0.23640487

00:29:57.000 --> 00:29:57.501 Um,

NOTE Confidence: 0.23640487

00:29:57.501 --> 00:29:58.002 so?

NOTE Confidence: 0.23640487

00:29:58.002 --> 00:30:00.507 All arrhythmias are obviously harbingers

NOTE Confidence: 0.23640487

00:30:00.507 --> 00:30:03.000 of poor cardiovascular implications,

NOTE Confidence: 0.23640487

00:30:03.000 --> 00:30:05.936 and so this is relevant outside of Afib,

NOTE Confidence: 0.23640487

00:30:05.940 --> 00:30:10.557 but Afib in particular has a another hit on.

NOTE Confidence: 0.23640487

00:30:10.560 --> 00:30:12.636 And because it can give rise

NOTE Confidence: 0.23640487

00:30:12.636 --> 00:30:14.020 to cardio embolic stroke.

NOTE Confidence: 0.23640487

00:30:14.020 --> 00:30:17.876 And so we've also noted in in

NOTE Confidence: 0.23640487

00:30:17.876 --> 00:30:20.324 various studies when it comes to

NOTE Confidence: 0.23640487

00:30:20.324 --> 00:30:23.529 Afib that there does seem to be

NOTE Confidence: 0.23640487

00:30:23.529 --> 00:30:25.824 a dose response relationship and

NOTE Confidence: 0.23640487

00:30:25.918 --> 00:30:28.728 where by increasing sleep apnea

NOTE Confidence: 0.23640487

00:30:28.728 --> 00:30:31.538 severity is associated with higher

NOTE Confidence: 0.23640487

00:30:31.540 --> 00:30:34.456 prevalence of Ethan and and also

NOTE Confidence: 0.23640487

00:30:34.456 --> 00:30:38.139 we've seen that in people with

NOTE Confidence: 0.23640487

00:30:38.139 --> 00:30:40.599 paroxysmal atrial fibrillation.

NOTE Confidence: 0.23640487

00:30:40.600 --> 00:30:41.059 Um,

NOTE Confidence: 0.23640487

00:30:41.059 --> 00:30:43.354 these paroxysms tend to emerge

NOTE Confidence: 0.23640487

00:30:43.354 --> 00:30:46.239 shortly after an apnea or hypopnea.

NOTE Confidence: 0.75378921

00:30:50.810 --> 00:30:55.087 So I'm moving on to mechanism 6,

NOTE Confidence: 0.75378921

00:30:55.090 --> 00:30:57.374 PFOA, and paradoxical embolism.

NOTE Confidence: 0.75378921

00:30:57.374 --> 00:31:00.800 And PFOA is a risk factor,

NOTE Confidence: 0.75378921

00:31:00.800 --> 00:31:02.465 a well known risk factor

NOTE Confidence: 0.75378921

00:31:02.465 --> 00:31:03.464 for cryptogenic stroke.

NOTE Confidence: 0.75378921

00:31:03.470 --> 00:31:06.788 It's more prevalent among patients with

NOTE Confidence: 0.75378921

00:31:06.788 --> 00:31:10.319 sleep apnea compared to those without.

NOTE Confidence: 0.75378921

00:31:10.320 --> 00:31:13.420 And sort of mechanistically speaking,

NOTE Confidence: 0.75378921

00:31:13.420 --> 00:31:16.075 frequent transient right side pressure

NOTE Confidence: 0.75378921

00:31:16.075 --> 00:31:18.730 increases during the apneas themselves

NOTE Confidence: 0.75378921

00:31:18.804 --> 00:31:21.457 can cause right to left shunting through

NOTE Confidence: 0.75378921

00:31:21.457 --> 00:31:23.977 the PTFO which can lead to stroke.

NOTE Confidence: 0.75378921

00:31:23.980 --> 00:31:26.724 And then also may contribute to nocturnal

NOTE Confidence: 0.75378921

00:31:26.724 --> 00:31:29.249 desaturation in the setting of shunting.

NOTE Confidence: 0.8201234095

00:31:34.780 --> 00:31:36.874 So now that we've established that

NOTE Confidence: 0.8201234095

00:31:36.874 --> 00:31:40.040 OSA is a risk factor for stroke and

NOTE Confidence: 0.8201234095

00:31:40.040 --> 00:31:42.572 explored many of the key mechanisms,

NOTE Confidence: 0.8201234095

00:31:42.580 --> 00:31:45.412 I'd like to focus the remainder of the

NOTE Confidence: 0.8201234095

00:31:45.412 --> 00:31:48.694 talk and hopefully some discussion about

NOTE Confidence: 0.8201234095

00:31:48.694 --> 00:31:52.378 the the on the treatment implications

NOTE Confidence: 0.8201234095

00:31:52.380 --> 00:31:54.546 and future directions in this domain.

NOTE Confidence: 0.84133796

00:31:58.520 --> 00:32:00.140 So why is this important?

NOTE Confidence: 0.84133796

00:32:00.140 --> 00:32:03.668 Well, currently acute

NOTE Confidence: 0.84133796

00:32:03.668 --> 00:32:06.080 ischemic stroke treatments,

NOTE Confidence: 0.84133796

00:32:06.080 --> 00:32:09.140 which have gotten quite excellent,

NOTE Confidence: 0.84133796

00:32:09.140 --> 00:32:11.926 are not widely applicable because of narrow,

NOTE Confidence: 0.84133796

00:32:11.930 --> 00:32:14.114 narrow therapeutic windows

NOTE Confidence: 0.84133796

00:32:14.114 --> 00:32:16.298 or accessibility issues.

NOTE Confidence: 0.84133796

00:32:16.300 --> 00:32:18.615 And there are basically no

NOTE Confidence: 0.84133796

00:32:18.615 --> 00:32:20.467 targeted therapies for for

NOTE Confidence: 0.84133796

00:32:20.467 --> 00:32:21.998 hemorrhagic stroke or Tia.

NOTE Confidence: 0.855835765555556

00:32:25.820 --> 00:32:29.116 So a logical hypothesis then is that PAP

NOTE Confidence: 0.855835765555556

00:32:29.116 --> 00:32:31.654 therapy will improve stroke outcomes

NOTE Confidence: 0.855835765555556

00:32:31.654 --> 00:32:34.374 and may reduce recurrent events.

NOTE Confidence: 0.855835765555556

00:32:34.380 --> 00:32:37.112 And it makes sense because, you know,

NOTE Confidence: 0.855835765555556

00:32:37.112 --> 00:32:39.884 we just talked about all of these

NOTE Confidence: 0.855835765555556

00:32:39.884 --> 00:32:42.188 mechanisms which are exacerbated by.

NOTE Confidence: 0.855835765555556

00:32:42.190 --> 00:32:43.144 Apnea burden.

NOTE Confidence: 0.855835765555556

00:32:43.144 --> 00:32:46.483 So if we reduce the apnea burden,

NOTE Confidence: 0.855835765555556

00:32:46.490 --> 00:32:48.686 then perhaps we can improve outcomes.

NOTE Confidence: 0.855835765555556

00:32:48.690 --> 00:32:49.850 And if this is true,

NOTE Confidence: 0.855835765555556

00:32:49.850 --> 00:32:53.492 then pat therapy and stroke patients

NOTE Confidence: 0.855835765555556

00:32:53.492 --> 00:32:56.430 may actually represent a new frontier

NOTE Confidence: 0.855835765555556

00:32:56.430 --> 00:32:58.270 in treatment which we really need.

NOTE Confidence: 0.860373726666667

00:33:01.720 --> 00:33:03.196 So first of all,

NOTE Confidence: 0.860373726666667

00:33:03.196 --> 00:33:06.640 what do we know about PAP and outcomes?

NOTE Confidence: 0.860373726666667

00:33:06.640 --> 00:33:11.026 And unfortunately, really not too much.

NOTE Confidence: 0.860373726666667

00:33:11.030 --> 00:33:13.442 You know, I even even went back to the

NOTE Confidence: 0.860373726666667

00:33:13.442 --> 00:33:15.061 literature as recently as yesterday

NOTE Confidence: 0.860373726666667

00:33:15.061 --> 00:33:16.999 and there's really not much there,

NOTE Confidence: 0.860373726666667

00:33:17.000 --> 00:33:19.268 and that's not for lack of effort.

NOTE Confidence: 0.860373726666667

00:33:19.270 --> 00:33:21.664 And we basically know that PAP

NOTE Confidence: 0.860373726666667

00:33:21.664 --> 00:33:23.799 use among post stroke patients

NOTE Confidence: 0.860373726666667

00:33:23.799 --> 00:33:26.064 appears to be associated with

NOTE Confidence: 0.860373726666667

00:33:26.064 --> 00:33:28.730 a decrease in stroke mortality.

NOTE Confidence: 0.860373726666667

00:33:28.730 --> 00:33:31.957 But this is largely based on observational

NOTE Confidence: 0.860373726666667

00:33:31.957 --> 00:33:34.789 studies and examining treatment efficacy,

NOTE Confidence: 0.860373726666667

00:33:34.790 --> 00:33:37.320 which are really subject to

NOTE Confidence: 0.860373726666667

00:33:37.320 --> 00:33:39.850 healthy user effect and thus

NOTE Confidence: 0.860373726666667

00:33:39.850 --> 00:33:42.610 tend to overestimate the effect.

NOTE Confidence: 0.860373726666667

00:33:42.610 --> 00:33:44.420 And for those unfamiliar with

NOTE Confidence: 0.860373726666667

00:33:44.420 --> 00:33:45.868 the healthy user effect,

NOTE Confidence: 0.860373726666667

00:33:45.870 --> 00:33:48.264 this is a phenomenon where patients

NOTE Confidence: 0.860373726666667

00:33:48.264 --> 00:33:50.810 who are adherent to one therapy,

NOTE Confidence: 0.860373726666667

00:33:50.810 --> 00:33:53.170 so in this case PAP,

NOTE Confidence: 0.860373726666667

00:33:53.170 --> 00:33:55.739 may also be adherent to other therapies

NOTE Confidence: 0.860373726666667

00:33:55.739 --> 00:33:58.110 or may value a healthier life.

NOTE Confidence: 0.860373726666667

00:33:58.110 --> 00:34:00.720 Style in other ways and other

NOTE Confidence: 0.860373726666667

00:34:00.720 --> 00:34:03.620 domains which may lead to an

NOTE Confidence: 0.860373726666667

00:34:03.620 --> 00:34:06.860 overestimate of the therapy of choice,

NOTE Confidence: 0.860373726666667

00:34:06.860 --> 00:34:09.068 of the effect that the therapy of choice.

NOTE Confidence: 0.768631471

00:34:11.270 --> 00:34:13.992 So we also know that RCT is

NOTE Confidence: 0.768631471

00:34:13.992 --> 00:34:15.747 to date have been small,

NOTE Confidence: 0.768631471

00:34:15.750 --> 00:34:18.180 so typically under 80 patients and

NOTE Confidence: 0.768631471

00:34:18.180 --> 00:34:21.129 have shown mixed results and the mixed

NOTE Confidence: 0.768631471

00:34:21.129 --> 00:34:23.643 results are thought to be multifactorial.

NOTE Confidence: 0.768631471

00:34:23.650 --> 00:34:27.026 But some issues or ideas as to why

NOTE Confidence: 0.768631471

00:34:27.026 --> 00:34:30.097 they're so mixed include variability

NOTE Confidence: 0.768631471

00:34:30.097 --> 00:34:32.937 and path initiation timing.

NOTE Confidence: 0.768631471

00:34:32.940 --> 00:34:37.189 Small sample sizes as well as varied

NOTE Confidence: 0.768631471

00:34:37.189 --> 00:34:40.620 endpoints such as you know, intermediate

NOTE Confidence: 0.768631471

00:34:40.620 --> 00:34:42.876 outcomes of cardiovascular disease,

NOTE Confidence: 0.768631471

00:34:42.880 --> 00:34:45.079 functional recovery, mortality.

NOTE Confidence: 0.892754126666667

00:34:49.210 --> 00:34:51.328 So what are the guidelines say?

NOTE Confidence: 0.892754126666667

00:34:51.330 --> 00:34:52.941 Well, before 2021,

NOTE Confidence: 0.892754126666667

00:34:52.941 --> 00:34:56.163 they didn't say much of anything.

NOTE Confidence: 0.892754126666667

00:34:56.170 --> 00:35:00.166 And now, as of the 2021

NOTE Confidence: 0.892754126666667

00:35:00.166 --> 00:35:02.946 update from the American Heart

NOTE Confidence: 0.892754126666667

00:35:02.946 --> 00:35:05.170 Association and Stroke guidelines,

NOTE Confidence: 0.892754126666667

00:35:05.170 --> 00:35:07.190 there's actually an entire section

NOTE Confidence: 0.892754126666667

00:35:07.190 --> 00:35:09.210 dedicated to obstructive sleep apnea,

NOTE Confidence: 0.892754126666667

00:35:09.210 --> 00:35:12.024 which is exciting and I think important.

NOTE Confidence: 0.892754126666667

00:35:12.030 --> 00:35:14.346 And so the recommendations are distilled

NOTE Confidence: 0.892754126666667

00:35:14.346 --> 00:35:17.070 down to the figure I'm showing here,

NOTE Confidence: 0.892754126666667

00:35:17.070 --> 00:35:18.074 but basically.

NOTE Confidence: 0.892754126666667

00:35:18.074 --> 00:35:21.588 They're saying that in patients with an

NOTE Confidence: 0.892754126666667

00:35:21.588 --> 00:35:25.225 escape chemic stroke or Tia and sleep apnea,

NOTE Confidence: 0.892754126666667

00:35:25.230 --> 00:35:27.828 treatment with positive airway pressure can

NOTE Confidence: 0.892754126666667

00:35:27.828 --> 00:35:30.369 be beneficial for improved sleep apnea,

NOTE Confidence: 0.892754126666667

00:35:30.370 --> 00:35:31.320 blood pressure,

NOTE Confidence: 0.892754126666667

00:35:31.320 --> 00:35:34.170 sleepiness and other apnea related outcomes,

NOTE Confidence: 0.892754126666667

00:35:34.170 --> 00:35:37.684 which is sort of a bucket of

NOTE Confidence: 0.892754126666667

00:35:37.690 --> 00:35:39.860 things that I think a lot of

NOTE Confidence: 0.892754126666667

00:35:39.860 --> 00:35:41.608 investigators are trying to teeth out.

NOTE Confidence: 0.892754126666667

00:35:41.610 --> 00:35:45.082 And and this is based on moderate

NOTE Confidence: 0.892754126666667

00:35:45.082 --> 00:35:47.668 evidence per their classification

NOTE Confidence: 0.892754126666667

00:35:47.668 --> 00:35:50.900 system and they also recommend that

NOTE Confidence: 0.892754126666667

00:35:50.900 --> 00:35:53.630 in patients with an ischemic stroke

NOTE Confidence: 0.892754126666667

00:35:53.630 --> 00:35:57.006 or Tia and evaluation for OSA may be

NOTE Confidence: 0.892754126666667

00:35:57.006 --> 00:35:59.388 considered to diagnose sleep apnea.

NOTE Confidence: 0.892754126666667

00:35:59.390 --> 00:36:02.470 And this is based on weak evidence

NOTE Confidence: 0.892754126666667

00:36:02.470 --> 00:36:05.398 by their classification system.

NOTE Confidence: 0.892754126666667

00:36:05.398 --> 00:36:07.330 And so I think, you know,

NOTE Confidence: 0.892754126666667

00:36:07.330 --> 00:36:10.438 the takeaways from here are that

NOTE Confidence: 0.892754126666667

00:36:10.438 --> 00:36:11.992 first of all.

NOTE Confidence: 0.892754126666667

00:36:12.000 --> 00:36:14.493 You know I think a lot of us believe

NOTE Confidence: 0.892754126666667

00:36:14.493 --> 00:36:17.149 that we probably should be testing all

NOTE Confidence: 0.892754126666667

00:36:17.149 --> 00:36:19.839 stroke and Tia patients for sleep apnea.

NOTE Confidence: 0.892754126666667

00:36:19.840 --> 00:36:21.736 But we can't really provide the

NOTE Confidence: 0.892754126666667

00:36:21.736 --> 00:36:24.185 evidence to back it up because of all

NOTE Confidence: 0.892754126666667

00:36:24.185 --> 00:36:26.235 of the reasons that we just discussed

NOTE Confidence: 0.892754126666667

00:36:26.235 --> 00:36:28.715 and all the issues with them with how

NOTE Confidence: 0.892754126666667

00:36:28.715 --> 00:36:31.364 do you study this population and and

NOTE Confidence: 0.892754126666667

00:36:31.364 --> 00:36:34.324 and keep it consistent so that you can

NOTE Confidence: 0.892754126666667

00:36:34.324 --> 00:36:37.168 actually make a a statement that is

NOTE Confidence: 0.892754126666667

00:36:37.170 --> 00:36:42.000 of better than weak recommendation.

NOTE Confidence: 0.892754126666667

00:36:42.000 --> 00:36:44.442 You'll also note that there is

NOTE Confidence: 0.892754126666667

00:36:44.442 --> 00:36:46.660 no mention of hemorrhagic stroke,

NOTE Confidence: 0.892754126666667

00:36:46.660 --> 00:36:48.964 and that's because of the large gap in

NOTE Confidence: 0.892754126666667

00:36:48.964 --> 00:36:50.650 literature which I mentioned earlier.

NOTE Confidence: 0.841258997913043

00:36:54.500 --> 00:36:57.398 So I'd like to take a few minutes to

NOTE Confidence: 0.841258997913043

00:36:57.398 --> 00:36:59.435 highlight some of the ongoing trials

NOTE Confidence: 0.841258997913043

00:36:59.435 --> 00:37:02.479 here at Yale and and around the country.

NOTE Confidence: 0.841258997913043

00:37:02.480 --> 00:37:05.138 And the first is rise up,

NOTE Confidence: 0.841258997913043

00:37:05.140 --> 00:37:08.152 which is basically looking at the

NOTE Confidence: 0.841258997913043

00:37:08.152 --> 00:37:10.764 question of whether PAP improves

NOTE Confidence: 0.841258997913043

00:37:10.764 --> 00:37:13.830 post stroke outcomes and what the

NOTE Confidence: 0.841258997913043

00:37:13.830 --> 00:37:17.040 ideal timing of PAP initiation is.

NOTE Confidence: 0.841258997913043

00:37:17.040 --> 00:37:19.182 And I'll also mention that my

NOTE Confidence: 0.841258997913043

00:37:19.182 --> 00:37:21.403 Co mentors Kevin, Jeff and Char

NOTE Confidence: 0.841258997913043

00:37:21.403 --> 00:37:24.070 Yaggi are Co Pi on this project.

NOTE Confidence: 0.841258997913043

00:37:24.070 --> 00:37:26.912 And so the study is actively enrolling

NOTE Confidence: 0.841258997913043

00:37:26.912 --> 00:37:29.807 patients with acute ischemic stroke in

NOTE Confidence: 0.841258997913043

00:37:29.807 --> 00:37:32.472 the hospital and performing ambulatory

NOTE Confidence: 0.841258997913043

00:37:32.472 --> 00:37:34.868 polysomnography in the acute setting.

NOTE Confidence: 0.841258997913043

00:37:34.870 --> 00:37:37.066 And just to mention,

NOTE Confidence: 0.841258997913043

00:37:37.066 --> 00:37:39.811 this technology is actually groundbreaking

NOTE Confidence: 0.841258997913043

00:37:39.811 --> 00:37:43.240 in and of itself to be able to do

NOTE Confidence: 0.841258997913043

00:37:43.240 --> 00:37:46.109 basically a full PSG in the hospital,

NOTE Confidence: 0.841258997913043

00:37:46.110 --> 00:37:46.966 you know,

NOTE Confidence: 0.841258997913043

00:37:46.966 --> 00:37:50.390 the day or two after an acute stroke

NOTE Confidence: 0.841258997913043

00:37:50.390 --> 00:37:53.726 definitely has the potential to build

NOTE Confidence: 0.841258997913043

00:37:53.726 --> 00:37:56.642 new diagnostic pathways for stroke

NOTE Confidence: 0.841258997913043

00:37:56.642 --> 00:37:59.637 patients if the outcomes warranted.

NOTE Confidence: 0.841258997913043

00:37:59.640 --> 00:38:02.400 So the study aims to determine if CPAP

NOTE Confidence: 0.841258997913043

00:38:02.400 --> 00:38:04.928 helps after stroke and if there's a

NOTE Confidence: 0.841258997913043

00:38:04.928 --> 00:38:07.423 difference in the degree of improvement

NOTE Confidence: 0.841258997913043

00:38:07.423 --> 00:38:10.200 between timing of acute intervention,

NOTE Confidence: 0.841258997913043

00:38:10.200 --> 00:38:13.952 which would be one week following stroke

NOTE Confidence: 0.841258997913043

00:38:13.952 --> 00:38:17.340 or sub acute intervention at one month.

NOTE Confidence: 0.841258997913043

00:38:17.340 --> 00:38:20.148 And the main outcome is functional

NOTE Confidence: 0.841258997913043

00:38:20.148 --> 00:38:23.509 recovery at six months following stroke.

NOTE Confidence: 0.841258997913043

00:38:23.510 --> 00:38:26.415 So the study was initially designed to

NOTE Confidence: 0.841258997913043

00:38:26.415 --> 00:38:29.106 enroll patients only with ischemic stroke,

NOTE Confidence: 0.841258997913043

00:38:29.106 --> 00:38:32.973 but we have since expanded it and to

NOTE Confidence: 0.841258997913043

00:38:32.973 --> 00:38:35.955 enroll an observational arm of patients

NOTE Confidence: 0.841258997913043

00:38:35.955 --> 00:38:38.633 with interest cerebral hemorrhage and

NOTE Confidence: 0.841258997913043

00:38:38.633 --> 00:38:41.819 given the strong association that we

NOTE Confidence: 0.841258997913043

00:38:41.819 --> 00:38:44.630 saw in my previously discussed work and

NOTE Confidence: 0.841258997913043

00:38:44.630 --> 00:38:46.699 the infrastructure through rise up and

NOTE Confidence: 0.841258997913043

00:38:46.699 --> 00:38:48.880 the mentorship team to be able to do it.

NOTE Confidence: 0.908584148181818

00:38:53.550 --> 00:38:55.692 Another study that I would like

NOTE Confidence: 0.908584148181818

00:38:55.692 --> 00:38:57.610 to mention is sleep smart.

NOTE Confidence: 0.908584148181818

00:38:57.610 --> 00:38:59.980 So this is a national sleep

NOTE Confidence: 0.908584148181818

00:38:59.980 --> 00:39:01.994 apnea and stroke treatment trial

NOTE Confidence: 0.908584148181818

00:39:01.994 --> 00:39:04.124 and Yale is a clinical site,

NOTE Confidence: 0.908584148181818

00:39:04.130 --> 00:39:07.426 and the aim here is to test whether

NOTE Confidence: 0.908584148181818

00:39:07.426 --> 00:39:10.682 a treatment of sleep apnea with pack

NOTE Confidence: 0.908584148181818

00:39:10.682 --> 00:39:13.988 therapy after a recent stroke or a

NOTE Confidence: 0.908584148181818

00:39:13.988 --> 00:39:17.446 high risk Tia prevents a recurrence of

NOTE Confidence: 0.908584148181818

00:39:17.446 --> 00:39:21.600 stroke or ACS or all cause mortality.

NOTE Confidence: 0.908584148181818

00:39:21.600 --> 00:39:25.064 As you can see from the the flow

NOTE Confidence: 0.908584148181818

00:39:25.064 --> 00:39:28.273 sheet protocol here and patients are

NOTE Confidence: 0.908584148181818

00:39:28.273 --> 00:39:31.645 screened and then again ambulatory full

NOTE Confidence: 0.908584148181818

00:39:31.741 --> 00:39:35.059 PSG is performed on the first night.

NOTE Confidence: 0.908584148181818

00:39:35.060 --> 00:39:36.675 Some patients don't qualify because

NOTE Confidence: 0.908584148181818

00:39:36.675 --> 00:39:38.290 they don't have sleep apnea,

NOTE Confidence: 0.908584148181818

00:39:38.290 --> 00:39:40.348 they don't have obstructive sleep apnea

NOTE Confidence: 0.908584148181818

00:39:40.348 --> 00:39:43.340 or they're limited to central sleep apnea.

NOTE Confidence: 0.908584148181818

00:39:43.340 --> 00:39:46.742 But if patients have an HIV of

NOTE Confidence: 0.908584148181818

00:39:46.742 --> 00:39:49.448 10 or greater then they are they

NOTE Confidence: 0.908584148181818

00:39:49.448 --> 00:39:52.110 they move on to a run in night.

NOTE Confidence: 0.908584148181818

00:39:52.110 --> 00:39:54.246 Time basically a trial of CPAP

NOTE Confidence: 0.908584148181818

00:39:54.246 --> 00:39:55.670 for the second night,

NOTE Confidence: 0.908584148181818

00:39:55.670 --> 00:39:58.739 and then some are not able to tolerate it,

NOTE Confidence: 0.908584148181818

00:39:58.740 --> 00:40:01.127 in which case they are not randomized.

NOTE Confidence: 0.908584148181818

00:40:01.130 --> 00:40:03.762 But those who are able to tolerate

NOTE Confidence: 0.908584148181818

00:40:03.762 --> 00:40:06.920 CPAP for four or more hours are

NOTE Confidence: 0.908584148181818

00:40:06.920 --> 00:40:09.350 then randomized into either the

NOTE Confidence: 0.908584148181818

00:40:09.350 --> 00:40:12.036 intervention group or the control group.

NOTE Confidence: 0.882875164

00:40:16.810 --> 00:40:17.728 And then finally,

NOTE Confidence: 0.882875164

00:40:17.728 --> 00:40:19.870 I'll just mention my own pilot study,

NOTE Confidence: 0.882875164

00:40:19.870 --> 00:40:21.952 which I alluded to briefly when

NOTE Confidence: 0.882875164

00:40:21.952 --> 00:40:24.410 I was telling you about rise up.

NOTE Confidence: 0.882875164

00:40:24.410 --> 00:40:26.362 So the evaluating neurological

NOTE Confidence: 0.882875164

00:40:26.362 --> 00:40:29.290 recovery in NIH and sleep apnea

NOTE Confidence: 0.882875164

00:40:29.370 --> 00:40:31.806 study or the enriched SA study,

NOTE Confidence: 0.882875164

00:40:31.810 --> 00:40:33.630 because everything needs a

NOTE Confidence: 0.882875164

00:40:33.630 --> 00:40:35.905 snazzy name to get funded,

NOTE Confidence: 0.882875164

00:40:35.910 --> 00:40:39.473 is a pilot project of mine that's

NOTE Confidence: 0.882875164

00:40:39.473 --> 00:40:42.110 currently funded by the ASM

NOTE Confidence: 0.882875164

00:40:42.110 --> 00:40:45.134 Foundation for one year this year.

NOTE Confidence: 0.882875164

00:40:45.140 --> 00:40:48.248 And I plan to enroll 20 patients

NOTE Confidence: 0.882875164

00:40:48.248 --> 00:40:50.064 with intracerebral hemorrhage in

NOTE Confidence: 0.882875164

00:40:50.064 --> 00:40:52.284 the hospital setting and perform

NOTE Confidence: 0.882875164

00:40:52.284 --> 00:40:54.252 that same wonderful ambulatory

NOTE Confidence: 0.882875164

00:40:54.252 --> 00:40:56.675 polysomnography that I've been telling

NOTE Confidence: 0.882875164

00:40:56.675 --> 00:40:59.628 you about in the acute setting.

NOTE Confidence: 0.882875164

00:40:59.630 --> 00:41:02.472 And my aims are to determine the

NOTE Confidence: 0.882875164

00:41:02.472 --> 00:41:05.384 prevalence of sleep apnea and it's

NOTE Confidence: 0.882875164

00:41:05.384 --> 00:41:08.235 individual physiologic traits and ICH.

NOTE Confidence: 0.882875164

00:41:08.235 --> 00:41:11.760 And to compare functional outcomes,

NOTE Confidence: 0.882875164

00:41:11.760 --> 00:41:13.940 which is the primary outcome,

NOTE Confidence: 0.882875164

00:41:13.940 --> 00:41:15.790 as well as cognitive status,

NOTE Confidence: 0.882875164

00:41:15.790 --> 00:41:19.122 which is the secondary outcome at three

NOTE Confidence: 0.882875164

00:41:19.122 --> 00:41:22.220 months post stroke among patients with

NOTE Confidence: 0.882875164

00:41:22.220 --> 00:41:26.019 among IH patients with and without OSA.

NOTE Confidence: 0.882875164

00:41:26.020 --> 00:41:28.402 And my hypothesis is that those

NOTE Confidence: 0.882875164

00:41:28.402 --> 00:41:31.506 with ICH who have sleep apnea will

NOTE Confidence: 0.882875164

00:41:31.506 --> 00:41:34.438 have worse outcomes at three months

NOTE Confidence: 0.882875164

00:41:34.438 --> 00:41:36.962 compared to those without OSA.

NOTE Confidence: 0.882875164

00:41:36.962 --> 00:41:40.329 And that measures of more severe sleep

NOTE Confidence: 0.882875164

00:41:40.329 --> 00:41:43.846 apnea will correlate with worse outcomes.

NOTE Confidence: 0.882875164

00:41:43.850 --> 00:41:45.514 And so I'm just,

NOTE Confidence: 0.882875164

00:41:45.514 --> 00:41:48.010 you know the sort of the,

NOTE Confidence: 0.882875164

00:41:48.010 --> 00:41:50.802 I think the most exciting aspect of this

NOTE Confidence: 0.882875164

00:41:50.802 --> 00:41:54.127 to me is actually doing the objective

NOTE Confidence: 0.882875164

00:41:54.127 --> 00:41:56.672 gold standard testing because while

NOTE Confidence: 0.882875164

00:41:56.750 --> 00:41:59.145 my previous work was very helpful

NOTE Confidence: 0.882875164

00:41:59.145 --> 00:42:02.115 to sort of highlight an association

NOTE Confidence: 0.882875164

00:42:02.115 --> 00:42:05.184 and one of our limitations was that

NOTE Confidence: 0.882875164

00:42:05.184 --> 00:42:07.353 the Berlin questionnaire was our

NOTE Confidence: 0.882875164

00:42:07.353 --> 00:42:09.627 our sort of diagnostic tool because

NOTE Confidence: 0.882875164

00:42:09.627 --> 00:42:12.408 there were no polysomnograms and so,

NOTE Confidence: 0.882875164

00:42:12.410 --> 00:42:14.690 so it's very exciting to be able to.

NOTE Confidence: 0.882875164

00:42:14.690 --> 00:42:16.532 Actually perform this.

NOTE Confidence: 0.882875164

00:42:16.532 --> 00:42:22.589 And so here you can see on the the plan.

NOTE Confidence: 0.882875164

00:42:22.590 --> 00:42:27.632 So so the patients will have a

NOTE Confidence: 0.882875164

00:42:27.632 --> 00:42:31.080 bunch of baseline assessments

NOTE Confidence: 0.882875164

00:42:31.080 --> 00:42:35.378 including certain metrics for IH,

NOTE Confidence: 0.882875164

00:42:35.378 --> 00:42:39.618 predicted outcomes and mortality as

NOTE Confidence: 0.882875164

00:42:39.618 --> 00:42:43.914 well as cognitive testing and then other

NOTE Confidence: 0.882875164

00:42:43.914 --> 00:42:47.420 and then other testing and then they will.

NOTE Confidence: 0.882875164

00:42:47.420 --> 00:42:50.804 Follow up at one month and then at three

NOTE Confidence: 0.882875164

00:42:50.804 --> 00:42:53.525 months and in this particular study

NOTE Confidence: 0.882875164

00:42:53.525 --> 00:42:56.296 there testing will end at three months.

NOTE Confidence: 0.882875164

00:42:56.300 --> 00:42:58.659 But as Clara mentioned at the beginning,

NOTE Confidence: 0.882875164

00:42:58.660 --> 00:43:04.649 I was just recently funded for KL2

NOTE Confidence: 0.882875164

00:43:04.649 --> 00:43:08.330 award in which we plan to look a lot

NOTE Confidence: 0.882875164

00:43:08.435 --> 00:43:11.688 more at the the phenotypes and and

NOTE Confidence: 0.882875164

00:43:11.688 --> 00:43:14.348 Physiology questions and actually study

NOTE Confidence: 0.882875164

00:43:14.348 --> 00:43:17.466 these patients out to six months time.

NOTE Confidence: 0.882875164

00:43:17.470 --> 00:43:20.300 To see their outcomes.

NOTE Confidence: 0.799979948

00:43:23.670 --> 00:43:25.590 Time. So on this slide,

NOTE Confidence: 0.799979948

00:43:25.590 --> 00:43:29.125 I've highlighted some of the knowledge gaps,

NOTE Confidence: 0.799979948

00:43:29.130 --> 00:43:31.386 many of which we kind of

NOTE Confidence: 0.799979948

00:43:31.386 --> 00:43:32.890 discussed through the talk,

NOTE Confidence: 0.799979948

00:43:32.890 --> 00:43:35.914 but just to lay them out there.

NOTE Confidence: 0.799979948

00:43:35.920 --> 00:43:39.420 They include who will benefit from CPAP?

NOTE Confidence: 0.799979948

00:43:39.420 --> 00:43:40.967 Because we don't want to force anyone

NOTE Confidence: 0.799979948

00:43:40.967 --> 00:43:42.769 to use CPAP if there's no reason to,

NOTE Confidence: 0.799979948

00:43:42.770 --> 00:43:45.596 because patients typically don't like it.

NOTE Confidence: 0.799979948

00:43:45.600 --> 00:43:48.064 And what is the ideal timing of

NOTE Confidence: 0.799979948

00:43:48.064 --> 00:43:49.620 testing and treatment initiation

NOTE Confidence: 0.799979948

00:43:49.620 --> 00:43:51.780 in relation to stroke onset?

NOTE Confidence: 0.799979948

00:43:51.780 --> 00:43:54.714 What dose and what type of PAP is most

NOTE Confidence: 0.799979948

00:43:54.714 --> 00:43:57.510 likely to work and to promote adherence?

NOTE Confidence: 0.799979948

00:43:57.510 --> 00:44:00.359 And what is the role of phenotyping?

NOTE Confidence: 0.799979948

00:44:00.360 --> 00:44:02.698 And is all that holds true for

NOTE Confidence: 0.799979948

00:44:02.698 --> 00:44:06.350 ischemic stroke and Tia true for ICH?

NOTE Confidence: 0.799979948

00:44:06.350 --> 00:44:07.800 And on a personal level,

NOTE Confidence: 0.799979948

00:44:07.800 --> 00:44:10.905 I am trying to tackle a few of these.

NOTE Confidence: 0.799979948

00:44:10.910 --> 00:44:13.730 And you know in in particular,

NOTE Confidence: 0.799979948

00:44:13.730 --> 00:44:15.974 I think that that final question

NOTE Confidence: 0.799979948

00:44:15.974 --> 00:44:18.453 and while it seems like it will

NOTE Confidence: 0.799979948

00:44:18.453 --> 00:44:20.292 be true and it makes physiologic

NOTE Confidence: 0.799979948

00:44:20.292 --> 00:44:22.224 sense that it would be true,

NOTE Confidence: 0.799979948

00:44:22.230 --> 00:44:24.470 it'll be really nice to actually show it.

NOTE Confidence: 0.799979948

00:44:24.470 --> 00:44:26.286 And so, so time,

NOTE Confidence: 0.799979948

00:44:26.286 --> 00:44:27.648 time will tell.

NOTE Confidence: 0.893829333333333

00:44:30.610 --> 00:44:36.142 So in summary, sleep apnea is independently

NOTE Confidence: 0.893829333333333

00:44:36.142 --> 00:44:39.507 associated with Tia and stroke,

NOTE Confidence: 0.893829333333333

00:44:39.510 --> 00:44:42.594 both ischemic and ICH,

NOTE Confidence: 0.893829333333333

00:44:42.594 --> 00:44:46.449 and the association appears somewhat

NOTE Confidence: 0.893829333333333

00:44:46.449 --> 00:44:49.660 bidirectional but vastly favors the

NOTE Confidence: 0.893829333333333

00:44:49.660 --> 00:44:52.840 direction of sleep apnea causing strokes.

NOTE Confidence: 0.893829333333333

00:44:52.840 --> 00:44:56.620 And mechanisms include intermittent hypoxia,

NOTE Confidence: 0.893829333333333

00:44:56.620 --> 00:44:58.202 sympathetic activation,

NOTE Confidence: 0.893829333333333

00:44:58.202 --> 00:44:59.784 metabolic dysfunction,

NOTE Confidence: 0.893829333333333

00:44:59.784 --> 00:45:02.157 shortened sleep duration,

NOTE Confidence: 0.893829333333333

00:45:02.160 --> 00:45:03.750 snoring and vibration

NOTE Confidence: 0.893829333333333

00:45:03.750 --> 00:45:05.340 induced carotid disease,

NOTE Confidence: 0.893829333333333

00:45:05.340 --> 00:45:06.969 arrhythmia, and PFOA.

NOTE Confidence: 0.886837410625

00:45:09.090 --> 00:45:10.398 Diabetes, hypertension and Afib

NOTE Confidence: 0.886837410625

00:45:10.398 --> 00:45:12.792 appear to be on the causal pathway

NOTE Confidence: 0.886837410625

00:45:12.792 --> 00:45:14.627 between sleep apnea and stroke.

NOTE Confidence: 0.843710904736842

00:45:16.920 --> 00:45:20.286 Challenges exist and conducting long term

NOTE Confidence: 0.843710904736842

00:45:20.286 --> 00:45:23.406 randomized controlled trials with CPAP and

NOTE Confidence: 0.843710904736842

00:45:23.406 --> 00:45:26.199 the benefit is not yet clearly defined.

NOTE Confidence: 0.843710904736842

00:45:26.200 --> 00:45:27.845 And then finally, I hope I've impressed

NOTE Confidence: 0.843710904736842

00:45:27.845 --> 00:45:29.901 upon you that there are a lot of new

NOTE Confidence: 0.843710904736842

00:45:29.901 --> 00:45:31.220 and exciting stroke trials underway.

NOTE Confidence: 0.843710904736842

00:45:31.220 --> 00:45:33.890 So I think that hopefully if

NOTE Confidence: 0.843710904736842

00:45:33.890 --> 00:45:36.320 I'm invited back to speak,

NOTE Confidence: 0.843710904736842

00:45:36.320 --> 00:45:39.603 you know in in several months to

NOTE Confidence: 0.843710904736842

00:45:39.603 --> 00:45:42.187 years that we will have more to say

NOTE Confidence: 0.843710904736842

00:45:42.187 --> 00:45:45.433 on these topics and maybe more some

NOTE Confidence: 0.843710904736842

00:45:45.433 --> 00:45:48.040 more concrete or definitive answers.

NOTE Confidence: 0.843710904736842

00:45:48.040 --> 00:45:49.728 So with that, I want to just thank

NOTE Confidence: 0.843710904736842

00:45:49.728 --> 00:45:51.139 everyone for your attention today.

NOTE Confidence: 0.843710904736842

00:45:51.140 --> 00:45:53.570 It really is a huge honor to talk about

NOTE Confidence: 0.843710904736842

00:45:53.570 --> 00:45:55.939 this topic with this particular group.

NOTE Confidence: 0.843710904736842

00:45:55.940 --> 00:45:58.355 And I definitely look forward to hearing

NOTE Confidence: 0.843710904736842

00:45:58.355 --> 00:46:00.686 questions as well as any thoughts and

NOTE Confidence: 0.843710904736842

00:46:00.686 --> 00:46:02.900 suggestions that anyone has as I start

NOTE Confidence: 0.843710904736842

00:46:02.900 --> 00:46:06.148 my own research career here at Yale.

NOTE Confidence: 0.843710904736842

00:46:06.150 --> 00:46:07.800 And before I take questions,

NOTE Confidence: 0.843710904736842

00:46:07.800 --> 00:46:10.280 I just want to thank my research mentors,

NOTE Confidence: 0.843710904736842

00:46:10.280 --> 00:46:11.860 specifically Clara and Kevin.

NOTE Confidence: 0.843710904736842

00:46:11.860 --> 00:46:13.835 I know it sounds corny,

NOTE Confidence: 0.843710904736842

00:46:13.840 --> 00:46:16.220 but they really did believe in me

NOTE Confidence: 0.843710904736842

00:46:16.220 --> 00:46:18.907 and my potential and when I had

NOTE Confidence: 0.843710904736842

00:46:18.907 --> 00:46:20.503 very little research background.

NOTE Confidence: 0.843710904736842

00:46:20.510 --> 00:46:23.696 So I'm forever grateful for that.

NOTE Confidence: 0.843710904736842

00:46:23.700 --> 00:46:24.741 And of course,

NOTE Confidence: 0.843710904736842

00:46:24.741 --> 00:46:26.476 here's an obligatory picture of

NOTE Confidence: 0.843710904736842

00:46:26.476 --> 00:46:29.180 my 3 little people who keep me

NOTE Confidence: 0.843710904736842

00:46:29.180 --> 00:46:31.120 very active and sleep deprived.

NOTE Confidence: 0.843710904736842

00:46:31.120 --> 00:46:32.552 And thank you again,

NOTE Confidence: 0.843710904736842

00:46:32.552 --> 00:46:34.700 and I'm happy to take questions.

NOTE Confidence: 0.595345294

00:46:36.990 --> 00:46:39.890 OK. That was wonderful, Jackie.

NOTE Confidence: 0.595345294

00:46:39.890 --> 00:46:43.770 Thank you for that overview and I think

NOTE Confidence: 0.595345294

00:46:43.770 --> 00:46:47.704 please folks, feel free to put in.

NOTE Confidence: 0.595345294

00:46:47.710 --> 00:46:49.720 Uh, some comments or questions

NOTE Confidence: 0.595345294

00:46:49.720 --> 00:46:52.487 in into the chat and and while

NOTE Confidence: 0.595345294

00:46:52.487 --> 00:46:54.560 we wait for folks to do that,

NOTE Confidence: 0.595345294

00:46:54.560 --> 00:46:57.390 I you know, I think.

NOTE Confidence: 0.595345294

00:46:57.390 --> 00:46:58.650 It is having been in,

NOTE Confidence: 0.595345294

00:46:58.650 --> 00:47:00.378 in this domain at least on the ischemic

NOTE Confidence: 0.595345294

00:47:00.378 --> 00:47:01.786 stroke side for a number of years.

NOTE Confidence: 0.595345294

00:47:01.790 --> 00:47:05.206 It really is quite amazing to me

NOTE Confidence: 0.595345294

00:47:05.210 --> 00:47:07.844 the developments that the field of

NOTE Confidence: 0.595345294

00:47:07.844 --> 00:47:10.332 neurology has had just a really

NOTE Confidence: 0.595345294

00:47:10.332 --> 00:47:12.600 in the last five to 10 years

NOTE Confidence: 0.595345294

00:47:12.600 --> 00:47:15.215 with endovascular treatments and

NOTE Confidence: 0.595345294

00:47:15.215 --> 00:47:18.167 medications and thrombolytic therapies.

NOTE Confidence: 0.595345294

00:47:18.170 --> 00:47:21.284 It is, it is just incredible

NOTE Confidence: 0.595345294

00:47:21.284 --> 00:47:24.481 expanding the hours of of therapy

NOTE Confidence: 0.595345294

00:47:24.481 --> 00:47:27.780 that many of these patients can get.

NOTE Confidence: 0.595345294

00:47:27.780 --> 00:47:29.034 Um treatments,

NOTE Confidence: 0.595345294

00:47:29.034 --> 00:47:33.554 but they're still is I think a large

NOTE Confidence: 0.595345294

00:47:33.554 --> 00:47:36.193 group of patients who have I would

NOTE Confidence: 0.595345294

00:47:36.193 --> 00:47:38.881 say probably particularly Jackie on

NOTE Confidence: 0.595345294

00:47:38.881 --> 00:47:42.261 on on the ICH side that have really

NOTE Confidence: 0.595345294

00:47:42.261 --> 00:47:44.605 profound functional and and cognitive

NOTE Confidence: 0.595345294

00:47:44.605 --> 00:47:46.717 impairment after their stroke.

NOTE Confidence: 0.595345294

00:47:46.720 --> 00:47:50.224 And so I think we're where this work

NOTE Confidence: 0.595345294

00:47:50.224 --> 00:47:52.471 is particularly promising and the

NOTE Confidence: 0.595345294

00:47:52.471 --> 00:47:55.474 work that you're doing in ICH is,

NOTE Confidence: 0.595345294

00:47:55.480 --> 00:47:57.888 is the idea that something that can be

NOTE Confidence: 0.595345294

00:47:57.888 --> 00:48:00.250 applied really to the majority of people who.

NOTE Confidence: 0.595345294

00:48:00.250 --> 00:48:02.532 Who have had these strokes given the

NOTE Confidence: 0.595345294

00:48:02.532 --> 00:48:03.874 prevalence estimates you're finding

NOTE Confidence: 0.595345294

00:48:03.874 --> 00:48:05.630 that can be continued, you know,

NOTE Confidence: 0.595345294

00:48:05.630 --> 00:48:06.955 started in the acute setting,

NOTE Confidence: 0.595345294

00:48:06.960 --> 00:48:09.148 potentially continued to over

NOTE Confidence: 0.595345294

00:48:09.148 --> 00:48:13.064 rehab and has the potential to to

NOTE Confidence: 0.595345294

00:48:13.064 --> 00:48:15.216 perhaps improve functional recovery

NOTE Confidence: 0.595345294

00:48:15.216 --> 00:48:19.368 is is really I think a sort of

NOTE Confidence: 0.595345294

00:48:19.368 --> 00:48:21.648 a novel line of investigation.

NOTE Confidence: 0.595345294

00:48:21.650 --> 00:48:22.098 The.

NOTE Confidence: 0.595345294

00:48:22.098 --> 00:48:25.234 You know, a couple of specific questions.

NOTE Confidence: 0.595345294

00:48:25.240 --> 00:48:28.630 One is I think another another

NOTE Confidence: 0.595345294

00:48:28.630 --> 00:48:31.299 sort of rationale for embarking

NOTE Confidence: 0.595345294

00:48:31.299 --> 00:48:33.864 on this investigation given what

NOTE Confidence: 0.595345294

00:48:33.864 --> 00:48:36.024 we've observed on the ischemic

NOTE Confidence: 0.595345294

00:48:36.024 --> 00:48:38.502 stroke side is that there's a lot

NOTE Confidence: 0.595345294

00:48:38.574 --> 00:48:40.886 of overlap mechanistically between

NOTE Confidence: 0.595345294

00:48:40.886 --> 00:48:44.150 aschematic stroke and ICH in terms

NOTE Confidence: 0.595345294

00:48:44.150 --> 00:48:45.680 of atherosclerosis mechanisms.

NOTE Confidence: 0.595345294

00:48:45.680 --> 00:48:47.927 And I think that played a role

NOTE Confidence: 0.595345294

00:48:47.927 --> 00:48:49.753 into the analytic strategy that

NOTE Confidence: 0.595345294

00:48:49.753 --> 00:48:52.123 you engaged in on that original

NOTE Confidence: 0.595345294

00:48:52.123 --> 00:48:53.719 cross section looking at.

NOTE Confidence: 0.595345294

00:48:53.720 --> 00:48:55.876 Sort of a layered analysis with hypertension.

NOTE Confidence: 0.595345294

00:48:55.880 --> 00:48:57.665 I wonder if you might make might

NOTE Confidence: 0.595345294

00:48:57.665 --> 00:48:59.299 speak a little bit more about,

NOTE Confidence: 0.595345294

00:48:59.300 --> 00:49:00.698 about that and the challenges of

NOTE Confidence: 0.595345294

00:49:00.698 --> 00:49:01.397 looking at that,

NOTE Confidence: 0.595345294

00:49:01.400 --> 00:49:02.910 some of those founding factors.

NOTE Confidence: 0.66414109

00:49:03.220 --> 00:49:06.106 Yeah. And yeah, no, it's definitely.

NOTE Confidence: 0.66414109

00:49:06.110 --> 00:49:08.330 I I agree with all that you said and I

NOTE Confidence: 0.66414109

00:49:08.391 --> 00:49:10.561 think that you're right that it really

NOTE Confidence: 0.66414109

00:49:10.561 --> 00:49:13.100 all comes back to sort of small vessel

NOTE Confidence: 0.66414109

00:49:13.100 --> 00:49:15.458 ischemic disease which is not intuitive

NOTE Confidence: 0.66414109

00:49:15.458 --> 00:49:19.330 and and and certainly not something

NOTE Confidence: 0.66414109

00:49:19.330 --> 00:49:21.890 that I would have thought was at all.

NOTE Confidence: 0.66414109

00:49:21.890 --> 00:49:24.714 You know I think when when internist think

NOTE Confidence: 0.66414109

00:49:24.714 --> 00:49:26.625 about hemorrhagic stroke or particularly

NOTE Confidence: 0.66414109

00:49:26.625 --> 00:49:28.535 you know interest cerebral hemorrhage

NOTE Confidence: 0.66414109

00:49:28.535 --> 00:49:31.151 as a stroke subtype we think about

NOTE Confidence: 0.66414109

00:49:31.151 --> 00:49:33.910 aneurysm rupture you know brain tumor you

NOTE Confidence: 0.66414109

00:49:33.910 --> 00:49:36.958 know I think it it takes a little bit.

NOTE Confidence: 0.66414109

00:49:36.960 --> 00:49:40.654 On. More education, I think,

NOTE Confidence: 0.66414109

00:49:40.654 --> 00:49:43.866 than we get in our basic internal medicine

NOTE Confidence: 0.66414109

00:49:43.866 --> 00:49:47.046 training to really understand the nuances,

NOTE Confidence: 0.66414109

00:49:47.050 --> 00:49:49.105 but it's it's really fascinating

NOTE Confidence: 0.66414109

00:49:49.105 --> 00:49:53.444 to see all you know it all of the.

NOTE Confidence: 0.66414109

00:49:53.450 --> 00:49:56.270 The similarities in pathophysiology between

NOTE Confidence: 0.66414109

00:49:56.270 --> 00:49:59.670 a schematic stroke and hemorrhagic stroke,

NOTE Confidence: 0.66414109

00:49:59.670 --> 00:50:03.774 or particularly IC H and so I think.

NOTE Confidence: 0.66414109

00:50:03.780 --> 00:50:04.872 To your point,

NOTE Confidence: 0.66414109

00:50:04.872 --> 00:50:07.420 it really does sort of lend itself.

NOTE Confidence: 0.66414109

00:50:07.420 --> 00:50:10.206 It's sort of shocking when you think

NOTE Confidence: 0.66414109

00:50:10.206 --> 00:50:12.556 about it that that this hasn't been

NOTE Confidence: 0.66414109

00:50:12.556 --> 00:50:14.580 done and that actually so if you,

NOTE Confidence: 0.66414109

00:50:14.580 --> 00:50:16.479 you know for a lot of studies that have,

NOTE Confidence: 0.66414109

00:50:16.480 --> 00:50:17.332 you know,

NOTE Confidence: 0.66414109

00:50:17.332 --> 00:50:19.036 brain hemorrhage was excluded

NOTE Confidence: 0.66414109

00:50:19.040 --> 00:50:22.360 and then I think that.

NOTE Confidence: 0.66414109

00:50:22.360 --> 00:50:25.123 As far as the sort of process of teasing

NOTE Confidence: 0.66414109

00:50:25.123 --> 00:50:30.580 it out since hypertension is such.

NOTE Confidence: 0.66414109

00:50:30.580 --> 00:50:34.830 Sort of a main risk factor for IC H and we

NOTE Confidence: 0.66414109

00:50:34.830 --> 00:50:38.619 spend a lot of time trying to figure out.

NOTE Confidence: 0.66414109

00:50:38.620 --> 00:50:39.964 You know how,

NOTE Confidence: 0.66414109

00:50:39.964 --> 00:50:42.652 how it's impact might not be

NOTE Confidence: 0.66414109

00:50:42.652 --> 00:50:44.350 over represented,

NOTE Confidence: 0.66414109

00:50:44.350 --> 00:50:45.982 but also not wanting to completely

NOTE Confidence: 0.66414109

00:50:45.982 --> 00:50:48.190 eliminate it because we know that it has

NOTE Confidence: 0.66414109

00:50:48.190 --> 00:50:49.792 a complex relationship with sleep apnea.

NOTE Confidence: 0.66414109

00:50:49.800 --> 00:50:52.999 And so as you as you mentioned

NOTE Confidence: 0.66414109

00:50:52.999 --> 00:50:55.390 we did several analysis.

NOTE Confidence: 0.66414109

00:50:55.390 --> 00:50:57.766 It's also worth noting that the

NOTE Confidence: 0.66414109

00:50:57.766 --> 00:50:58.954 Berlin questionnaire includes

NOTE Confidence: 0.66414109

00:50:58.954 --> 00:51:00.955 hypertension as one of the main

NOTE Confidence: 0.66414109

00:51:00.955 --> 00:51:02.505 components of the questionnaire itself,

NOTE Confidence: 0.66414109

00:51:02.510 --> 00:51:05.558 and so on.

NOTE Confidence: 0.66414109

00:51:05.560 --> 00:51:06.304 What we ended,

NOTE Confidence: 0.66414109

00:51:06.304 --> 00:51:07.544 we did one analysis actually

NOTE Confidence: 0.66414109

00:51:07.544 --> 00:51:09.254 where we just removed hypertension

NOTE Confidence: 0.66414109

00:51:09.254 --> 00:51:10.806 from the Berlin questionnaires.

NOTE Confidence: 0.66414109

00:51:10.810 --> 00:51:13.589 We rescored them and then ran the

NOTE Confidence: 0.66414109

00:51:13.589 --> 00:51:16.439 analysis because we we wanted to sort of,

NOTE Confidence: 0.66414109

00:51:16.440 --> 00:51:17.102 you know,

NOTE Confidence: 0.66414109

00:51:17.102 --> 00:51:19.419 play a worst case scenario for hypertension,

NOTE Confidence: 0.66414109

00:51:19.420 --> 00:51:22.094 best case scenario for the connection and

NOTE Confidence: 0.66414109

00:51:22.094 --> 00:51:24.679 it's still remained a significant finding.

NOTE Confidence: 0.66414109

00:51:24.680 --> 00:51:26.504 And so I think that the the challenge

NOTE Confidence: 0.66414109

00:51:26.504 --> 00:51:28.657 for me and I think for a lot of us is

NOTE Confidence: 0.66414109

00:51:28.657 --> 00:51:30.186 that there is no standard approach

NOTE Confidence: 0.66414109

00:51:30.186 --> 00:51:32.504 to this and you want to make sure

NOTE Confidence: 0.66414109

00:51:32.504 --> 00:51:34.194 that what you're finding makes

NOTE Confidence: 0.66414109

00:51:34.194 --> 00:51:36.292 physiologic sense and is plausible.

NOTE Confidence: 0.66414109

00:51:36.292 --> 00:51:36.730 Um,

NOTE Confidence: 0.66414109

00:51:36.730 --> 00:51:39.630 but but there's no manual for how to do it.

NOTE Confidence: 0.66414109

00:51:39.630 --> 00:51:40.686 Or or you know,

NOTE Confidence: 0.66414109

00:51:40.686 --> 00:51:42.006 which which analysis is going

NOTE Confidence: 0.66414109

00:51:42.006 --> 00:51:43.952 to is going to say, OK, see,

NOTE Confidence: 0.66414109

00:51:43.952 --> 00:51:45.436 this is definitely accurate,

NOTE Confidence: 0.66414109

00:51:45.440 --> 00:51:47.000 but I think we can safely say that

NOTE Confidence: 0.66414109

00:51:47.000 --> 00:51:48.309 we're really on to something here,

NOTE Confidence: 0.66414109

00:51:48.310 --> 00:51:50.170 even when we exclude hypertension.

NOTE Confidence: 0.71909888

00:51:51.350 --> 00:51:53.950 OK, so there's a several

NOTE Confidence: 0.71909888

00:51:53.950 --> 00:51:56.030 questions in the chat.

NOTE Confidence: 0.71909888

00:51:56.030 --> 00:51:59.408 The first is from Doctor Hoffman,

NOTE Confidence: 0.71909888

00:51:59.410 --> 00:52:00.720 which is an interesting question.

NOTE Confidence: 0.71909888

00:52:00.720 --> 00:52:02.495 So any concerns about increased

NOTE Confidence: 0.71909888

00:52:02.495 --> 00:52:03.915 intercranial pressure with CPAP

NOTE Confidence: 0.71909888

00:52:03.915 --> 00:52:05.620 in an acute stroke setting?

NOTE Confidence: 0.851532476666667

00:52:06.970 --> 00:52:08.848 So I I've had the same,

NOTE Confidence: 0.851532476666667

00:52:08.850 --> 00:52:10.310 I've had the same thought.

NOTE Confidence: 0.851532476666667

00:52:10.310 --> 00:52:13.542 I I think the answer is that it's

NOTE Confidence: 0.851532476666667

00:52:13.542 --> 00:52:16.000 probably not high enough pressure

NOTE Confidence: 0.851532476666667

00:52:16.000 --> 00:52:19.108 and we're and we're not dealing.

NOTE Confidence: 0.851532476666667

00:52:19.110 --> 00:52:20.190 I I don't actually know

NOTE Confidence: 0.851532476666667

00:52:20.190 --> 00:52:21.270 exactly how to answer that.

NOTE Confidence: 0.851532476666667

00:52:21.270 --> 00:52:22.452 I think it's an excellent question

NOTE Confidence: 0.851532476666667

00:52:22.452 --> 00:52:23.749 and I think that the general,

NOTE Confidence: 0.851532476666667

00:52:23.750 --> 00:52:27.880 the consensus is that no.

NOTE Confidence: 0.851532476666667

00:52:27.880 --> 00:52:29.028 That the pressures are

NOTE Confidence: 0.851532476666667

00:52:29.028 --> 00:52:30.176 probably not high enough,

NOTE Confidence: 0.851532476666667

00:52:30.180 --> 00:52:32.903 but I can't say that this has

NOTE Confidence: 0.851532476666667

00:52:32.903 --> 00:52:35.472 actually been studied and to to my

NOTE Confidence: 0.851532476666667

00:52:35.472 --> 00:52:37.868 knowledge I'm not sure if if, Kevin,

NOTE Confidence: 0.851532476666667

00:52:37.868 --> 00:52:39.740 I see you're you're on the call or if

NOTE Confidence: 0.851532476666667

00:52:39.790 --> 00:52:41.400 anyone else has an answer to this.

NOTE Confidence: 0.6557024716

00:52:42.940 --> 00:52:44.030 And I mean, it's a,

NOTE Confidence: 0.6557024716

00:52:44.030 --> 00:52:45.450 it's a good question,

NOTE Confidence: 0.6557024716

00:52:45.450 --> 00:52:47.790 but it turns out actually ICP is

NOTE Confidence: 0.6557024716

00:52:47.790 --> 00:52:51.340 virtually never important Q stroke.

NOTE Confidence: 0.6557024716

00:52:51.340 --> 00:52:53.420 And it just it just in terms of

NOTE Confidence: 0.6557024716

00:52:53.420 --> 00:52:55.080 prevalence it's only in the hyper

NOTE Confidence: 0.6557024716

00:52:55.080 --> 00:52:56.706 acute setting and the most sort

NOTE Confidence: 0.6557024716

00:52:56.763 --> 00:52:58.971 of you know in the most severe or

NOTE Confidence: 0.6557024716

00:52:58.971 --> 00:53:00.253 largest infarcts or hemorrhages that

NOTE Confidence: 0.6557024716

00:53:00.253 --> 00:53:02.252 ICP ends up being an issue and and

NOTE Confidence: 0.6557024716

00:53:02.252 --> 00:53:03.788 those patients either just going to

NOTE Confidence: 0.6557024716

00:53:03.788 --> 00:53:05.726 be very small population or going to

NOTE Confidence: 0.6557024716

00:53:05.726 --> 00:53:07.406 be excluded from all these studies.

NOTE Confidence: 0.674705215

00:53:08.960 --> 00:53:09.870 It would be an exception

NOTE Confidence: 0.715591471428571

00:53:09.880 --> 00:53:11.280 in all the other patients that just,

NOTE Confidence: 0.715591471428571

00:53:11.280 --> 00:53:12.966 it turns out not to matter

NOTE Confidence: 0.803518461428571

00:53:12.980 --> 00:53:15.115 at all. OK, thanks. That makes sense.

NOTE Confidence: 0.803518461428571

00:53:15.120 --> 00:53:16.740 So basically if it if it is a concern,

NOTE Confidence: 0.803518461428571

00:53:16.740 --> 00:53:19.400 the patients probably intubated anyway

NOTE Confidence: 0.803518461428571

00:53:19.400 --> 00:53:22.510 and by the time if they are able to be

NOTE Confidence: 0.803518461428571

00:53:22.593 --> 00:53:24.546 extubated and potentially use CPAP,

NOTE Confidence: 0.803518461428571

00:53:24.546 --> 00:53:26.860 it's it's probably not an issue anymore?

NOTE Confidence: 0.804854076

00:53:29.780 --> 00:53:31.404 There's another question, Jackie.

NOTE Confidence: 0.804854076

00:53:31.404 --> 00:53:33.840 And so based on your observations,

NOTE Confidence: 0.804854076

00:53:33.840 --> 00:53:35.676 when would you consider an ideal

NOTE Confidence: 0.804854076

00:53:35.676 --> 00:53:37.640 time to start PAP therapy in,

NOTE Confidence: 0.804854076

00:53:37.640 --> 00:53:38.848 in post stroke patients?

NOTE Confidence: 0.886490195555556

00:53:39.790 --> 00:53:41.308 So I think that's sort of

NOTE Confidence: 0.886490195555556

00:53:41.308 --> 00:53:42.067 the $1,000,000 question.

NOTE Confidence: 0.886490195555556

00:53:42.070 --> 00:53:45.076 And I think probably 1 component,

NOTE Confidence: 0.886490195555556

00:53:45.080 --> 00:53:47.467 which I didn't speak much about today

NOTE Confidence: 0.886490195555556

00:53:47.470 --> 00:53:50.146 but is vitally important, is adherence.

NOTE Confidence: 0.886490195555556

00:53:50.150 --> 00:53:52.630 I think you want to find the best

NOTE Confidence: 0.886490195555556

00:53:52.630 --> 00:53:55.448 balance on like when is it most tolerant,

NOTE Confidence: 0.886490195555556

00:53:55.450 --> 00:53:57.907 like when will the patient tolerate it?

NOTE Confidence: 0.886490195555556

00:53:57.910 --> 00:53:58.866 Because you, you know,

NOTE Confidence: 0.886490195555556

00:53:58.866 --> 00:54:00.061 even if there were some

NOTE Confidence: 0.886490195555556

00:54:00.061 --> 00:54:01.348 marginal benefit to starting it,

NOTE Confidence: 0.886490195555556

00:54:01.350 --> 00:54:04.374 like the day they come in for their stroke,

NOTE Confidence: 0.886490195555556

00:54:04.380 --> 00:54:06.642 say, you know, if they're totally

NOTE Confidence: 0.886490195555556

00:54:06.642 --> 00:54:08.150 overwhelmed by everything that's

NOTE Confidence: 0.886490195555556

00:54:08.209 --> 00:54:09.980 going on or they have some new.

NOTE Confidence: 0.886490195555556

00:54:09.980 --> 00:54:11.590 Um, functional limitation that they're

NOTE Confidence: 0.886490195555556

00:54:11.590 --> 00:54:13.588 aware of and they're, you know,

NOTE Confidence: 0.886490195555556

00:54:13.588 --> 00:54:16.066 there's a lot of sort of like.

NOTE Confidence: 0.886490195555556

00:54:16.070 --> 00:54:18.286 You know emotional, physical,

NOTE Confidence: 0.886490195555556

00:54:18.286 --> 00:54:19.948 cognitive components here.

NOTE Confidence: 0.886490195555556

00:54:19.950 --> 00:54:22.478 And so I think that like my overall

NOTE Confidence: 0.886490195555556

00:54:22.478 --> 00:54:25.040 answer is that the best time is when

NOTE Confidence: 0.886490195555556

00:54:25.040 --> 00:54:27.900 they'll use it if we think it's helpful,

NOTE Confidence: 0.886490195555556

00:54:27.900 --> 00:54:29.964 which I think the majority of us do.

NOTE Confidence: 0.886490195555556

00:54:29.970 --> 00:54:31.346 And that being said,

NOTE Confidence: 0.886490195555556

00:54:31.346 --> 00:54:34.730 I think that's a huge area of ongoing study.

NOTE Confidence: 0.886490195555556

00:54:34.730 --> 00:54:37.490 I mean particularly as far as its impact

NOTE Confidence: 0.886490195555556

00:54:37.490 --> 00:54:39.951 on outcomes what you know what timing

NOTE Confidence: 0.886490195555556

00:54:39.951 --> 00:54:42.492 is ideal for for outcomes and and I

NOTE Confidence: 0.886490195555556

00:54:42.492 --> 00:54:44.596 will put a plug in that we're we're

NOTE Confidence: 0.886490195555556

00:54:44.596 --> 00:54:47.370 also for rise up one of the things that I.

NOTE Confidence: 0.886490195555556

00:54:47.370 --> 00:54:49.226 I'm excited to be a part of is

NOTE Confidence: 0.886490195555556

00:54:49.226 --> 00:54:51.218 working on the qualitative component,

NOTE Confidence: 0.886490195555556

00:54:51.220 --> 00:54:54.160 kind of talking to people about

NOTE Confidence: 0.886490195555556

00:54:54.160 --> 00:54:56.040 their experiences in the study,

NOTE Confidence: 0.886490195555556

00:54:56.040 --> 00:54:56.940 with the path,

NOTE Confidence: 0.886490195555556

00:54:56.940 --> 00:54:59.538 with their stroke and kind of

NOTE Confidence: 0.886490195555556

00:54:59.540 --> 00:55:03.230 hearing a little bit more about.

NOTE Confidence: 0.886490195555556

00:55:03.230 --> 00:55:03.538 What?

NOTE Confidence: 0.886490195555556

00:55:03.538 --> 00:55:03.846 Like,

NOTE Confidence: 0.886490195555556

00:55:03.846 --> 00:55:05.386 what plays into that because

NOTE Confidence: 0.886490195555556

00:55:05.386 --> 00:55:06.720 they think adherence is key?

NOTE Confidence: 0.779107035714286

00:55:08.790 --> 00:55:10.029 I think those are all great points.

NOTE Confidence: 0.779107035714286

00:55:10.030 --> 00:55:12.448 I would just add you know we're

NOTE Confidence: 0.779107035714286

00:55:12.448 --> 00:55:14.534 a little bit further ahead on the

NOTE Confidence: 0.779107035714286

00:55:14.534 --> 00:55:16.409 ischemic stroke side than the ICH side

NOTE Confidence: 0.779107035714286

00:55:16.409 --> 00:55:18.389 at looking at the this timing issue.

NOTE Confidence: 0.779107035714286

00:55:18.390 --> 00:55:21.652 And I think some of the preliminary

NOTE Confidence: 0.779107035714286

00:55:21.652 --> 00:55:24.669 studies that have been done have

NOTE Confidence: 0.779107035714286

00:55:24.669 --> 00:55:27.894 suggested that the earlier the initiation

NOTE Confidence: 0.779107035714286

00:55:27.894 --> 00:55:31.106 of PAP therapy may be of theoretical

NOTE Confidence: 0.779107035714286

00:55:31.106 --> 00:55:33.440 benefit and the acute stroke setting

NOTE Confidence: 0.779107035714286

00:55:33.513 --> 00:55:35.985 to a brain and and and an ischemic

NOTE Confidence: 0.779107035714286

00:55:35.985 --> 00:55:38.581 penumbra of the brain that may be

NOTE Confidence: 0.779107035714286

00:55:38.581 --> 00:55:41.076 particularly susceptible to some of the.

NOTE Confidence: 0.779107035714286

00:55:41.076 --> 00:55:43.956 Physiologic sequelae of sleep apnea

NOTE Confidence: 0.779107035714286

00:55:43.960 --> 00:55:46.095 and that was that's sort of the.

NOTE Confidence: 0.779107035714286

00:55:46.100 --> 00:55:48.332 But at the same time to Jackie's point you,

NOTE Confidence: 0.779107035714286

00:55:48.340 --> 00:55:50.224 you have you have patients who

NOTE Confidence: 0.779107035714286

00:55:50.224 --> 00:55:52.289 are acutely stroked and might have

NOTE Confidence: 0.779107035714286

00:55:52.289 --> 00:55:54.515 difficulty adhering to or tolerating so.

NOTE Confidence: 0.779107035714286

00:55:54.520 --> 00:55:56.816 So I think that that time point is

NOTE Confidence: 0.779107035714286

00:55:56.816 --> 00:55:58.994 needs to needs to be worked out

NOTE Confidence: 0.779107035714286

00:55:58.994 --> 00:56:01.387 but the thing about you know having

NOTE Confidence: 0.779107035714286

00:56:01.387 --> 00:56:03.751 this as a complementary acute stroke

NOTE Confidence: 0.779107035714286

00:56:03.751 --> 00:56:07.008 therapy is I think very appealing.

NOTE Confidence: 0.779107035714286

00:56:07.010 --> 00:56:07.560 Umm.

NOTE Confidence: 0.709080966

00:56:10.000 --> 00:56:11.530 Let's see here.

NOTE Confidence: 0.709080966

00:56:11.530 --> 00:56:13.630 So Kevin, do you want to

NOTE Confidence: 0.709080966

00:56:13.630 --> 00:56:14.980 weigh in with your question?

NOTE Confidence: 0.709080966

00:56:14.980 --> 00:56:16.402 I'm just curious, Jackie,

NOTE Confidence: 0.709080966

00:56:16.402 --> 00:56:18.466 there's great, great talk.

NOTE Confidence: 0.709080966

00:56:18.470 --> 00:56:19.807 I may have asked you this before

NOTE Confidence: 0.709080966

00:56:19.807 --> 00:56:21.536 in the past, but good to just,

NOTE Confidence: 0.709080966

00:56:21.536 --> 00:56:23.670 let's just forecast the future of touch,

NOTE Confidence: 0.709080966

00:56:23.670 --> 00:56:25.116 let's say rise up and sleep,

NOTE Confidence: 0.709080966

00:56:25.120 --> 00:56:26.416 smarter neutral studies.

NOTE Confidence: 0.709080966

00:56:26.416 --> 00:56:28.838 How are we going to think about

NOTE Confidence: 0.709080966

00:56:28.838 --> 00:56:29.929 interpreting those findings

NOTE Confidence: 0.709080966

00:56:29.929 --> 00:56:31.289 and what's next for,

NOTE Confidence: 0.709080966

00:56:31.290 --> 00:56:33.240 what does that mean for sleep

NOTE Confidence: 0.709080966

00:56:33.240 --> 00:56:35.390 and also PAP and and stroke?

NOTE Confidence: 0.90398066

00:56:36.080 --> 00:56:37.625 Yeah, I know. I mean, I think that's

NOTE Confidence: 0.90398066

00:56:37.625 --> 00:56:39.660 like we have to kind of prepare that.

NOTE Confidence: 0.90398066

00:56:39.660 --> 00:56:41.015 That's probably going to happen, right?

NOTE Confidence: 0.90398066

00:56:41.015 --> 00:56:42.965 And then what do we do?

NOTE Confidence: 0.90398066

00:56:42.970 --> 00:56:44.202 What does it mean?

NOTE Confidence: 0.90398066

00:56:44.202 --> 00:56:46.575 It's sort of like all the sepsis

NOTE Confidence: 0.90398066

00:56:46.575 --> 00:56:47.940 and steroid trials.

NOTE Confidence: 0.90398066

00:56:47.940 --> 00:56:50.156 I think I'm going to say that it

NOTE Confidence: 0.90398066

00:56:50.156 --> 00:56:52.459 will probably then come down to the whole,

NOTE Confidence: 0.90398066

00:56:52.460 --> 00:56:54.272 I didn't talk too much about

NOTE Confidence: 0.90398066

00:56:54.272 --> 00:56:55.178 the phenotyping today.

NOTE Confidence: 0.90398066

00:56:55.180 --> 00:56:56.980 I think maybe for another talk I would

NOTE Confidence: 0.90398066

00:56:56.980 --> 00:56:59.099 love to to do that when I have some data.

NOTE Confidence: 0.90398066

00:56:59.100 --> 00:57:03.700 But I think that it may come down to an

NOTE Confidence: 0.90398066

00:57:03.821 --> 00:57:08.368 issue of sort of like of means versus sub

NOTE Confidence: 0.90398066

00:57:08.368 --> 00:57:12.364 you know subgroups and that there there

NOTE Confidence: 0.90398066

00:57:12.364 --> 00:57:16.576 may be certain sleep apnea phenotypes.

NOTE Confidence: 0.90398066

00:57:16.580 --> 00:57:19.442 Or or maybe sort of cardiometabolic

NOTE Confidence: 0.90398066

00:57:19.442 --> 00:57:22.513 phenotypes that do respond and and others

NOTE Confidence: 0.90398066

00:57:22.513 --> 00:57:25.510 who don't who kind of dilute the pool.

NOTE Confidence: 0.90398066

00:57:25.510 --> 00:57:26.374 And so, you know,

NOTE Confidence: 0.90398066

00:57:26.374 --> 00:57:29.120 it's always, it's tricky.

NOTE Confidence: 0.90398066

00:57:29.120 --> 00:57:30.650 It's it's tricky when it happens,

NOTE Confidence: 0.90398066

00:57:30.650 --> 00:57:31.966 but I I don't think the game

NOTE Confidence: 0.90398066

00:57:31.966 --> 00:57:32.820 is over and I do.

NOTE Confidence: 0.90398066

00:57:32.820 --> 00:57:34.368 I think we all kind of

NOTE Confidence: 0.90398066

00:57:34.368 --> 00:57:35.400 firmly believe that it.

NOTE Confidence: 0.90398066

00:57:35.400 --> 00:57:36.925 You know if sleep apnea

NOTE Confidence: 0.90398066

00:57:36.925 --> 00:57:39.000 causes is a cause for stroke,

NOTE Confidence: 0.90398066

00:57:39.000 --> 00:57:41.744 how can treating the sleep apnea with the

NOTE Confidence: 0.90398066

00:57:41.744 --> 00:57:44.019 world's most effective treatment not?

NOTE Confidence: 0.90398066

00:57:44.020 --> 00:57:44.544 You know,

NOTE Confidence: 0.90398066

00:57:44.544 --> 00:57:47.124 actually help them in some way or at least

NOTE Confidence: 0.90398066

00:57:47.124 --> 00:57:49.259 prevent recurrent strokes or cognitive,

NOTE Confidence: 0.90398066

00:57:49.260 --> 00:57:51.240 you know,

NOTE Confidence: 0.90398066

00:57:51.240 --> 00:57:52.101 cause, you know,

NOTE Confidence: 0.90398066

00:57:52.101 --> 00:57:53.823 improve cognition and things like that.

NOTE Confidence: 0.854773196

00:57:55.580 --> 00:57:57.446 Very good. Thank you very much

NOTE Confidence: 0.854773196

00:57:57.446 --> 00:57:58.690 for excellent presentation and

NOTE Confidence: 0.854773196

00:57:58.745 --> 00:58:00.430 and the great questions everyone.

NOTE Confidence: 0.854773196

00:58:00.430 --> 00:58:02.118 I think we're going to wrap up now.

NOTE Confidence: 0.854773196

00:58:02.120 --> 00:58:03.539 There's another conference

NOTE Confidence: 0.854773196

00:58:03.539 --> 00:58:04.958 immediately following this.

NOTE Confidence: 0.854773196

00:58:04.960 --> 00:58:06.080 Have a great rest of your week,

NOTE Confidence: 0.854773196

00:58:06.080 --> 00:58:08.000 everyone. Thanks everyone.