

WEBVTT

NOTE duration:"01:01:41"

NOTE recognizability:0.798

NOTE language:en-us

NOTE Confidence: 0.8850554275

00:00:00.000 --> 00:00:05.481 Sleep centers and just a few announcements

NOTE Confidence: 0.8850554275

00:00:05.481 --> 00:00:07.534 before we introduce today's speaker.

NOTE Confidence: 0.8850554275

00:00:07.534 --> 00:00:09.730 So first, please take a moment

NOTE Confidence: 0.8850554275

00:00:09.730 --> 00:00:12.295 that you are muted and if you

NOTE Confidence: 0.8850554275

00:00:12.295 --> 00:00:13.970 wanted to receive CME credit,

NOTE Confidence: 0.8850554275

00:00:13.970 --> 00:00:16.570 please see the chat room for instructions.

NOTE Confidence: 0.8850554275

00:00:16.570 --> 00:00:18.250 If you're not registered yet,

NOTE Confidence: 0.8850554275

00:00:18.250 --> 00:00:20.260 you'll have to do that

NOTE Confidence: 0.8850554275

00:00:20.260 --> 00:00:21.868 before you receive credit.

NOTE Confidence: 0.8850554275

00:00:21.870 --> 00:00:24.084 And then usually the recording of

NOTE Confidence: 0.8850554275

00:00:24.084 --> 00:00:25.928 this session is available online

NOTE Confidence: 0.8850554275

00:00:25.928 --> 00:00:28.070 within a couple of weeks and the

NOTE Confidence: 0.8850554275

00:00:28.070 --> 00:00:30.249 link will be provided in the chat.

NOTE Confidence: 0.8850554275

00:00:30.250 --> 00:00:31.940 And if you have questions,
NOTE Confidence: 0.8850554275

00:00:31.940 --> 00:00:35.279 please make use of the chat room.
NOTE Confidence: 0.8850554275

00:00:35.280 --> 00:00:36.644 And throughout the hour.
NOTE Confidence: 0.8850554275

00:00:36.644 --> 00:00:39.036 And we will get to them at
NOTE Confidence: 0.8850554275

00:00:39.036 --> 00:00:40.396 the end of the talk.
NOTE Confidence: 0.8850554275

00:00:40.400 --> 00:00:42.906 And so I'm going to hand it
NOTE Confidence: 0.8850554275

00:00:42.906 --> 00:00:44.840 over to Doctor Javaheri,
NOTE Confidence: 0.8850554275

00:00:44.840 --> 00:00:47.980 who will introduce today's speaker.
NOTE Confidence: 0.8850554275

00:00:47.980 --> 00:00:48.640 Welcome, Sir.
NOTE Confidence: 0.8850554275

00:00:48.640 --> 00:00:48.970 Well,
NOTE Confidence: 0.753153788571429

00:00:49.520 --> 00:00:51.396 thank you so much.
NOTE Confidence: 0.753153788571429

00:00:51.396 --> 00:00:54.210 It is my honor to introduce
NOTE Confidence: 0.753153788571429

00:00:54.314 --> 00:00:56.658 Doctor Ali Azar Barzin.
NOTE Confidence: 0.753153788571429

00:00:56.660 --> 00:00:58.436 He's an assistant professor in the
NOTE Confidence: 0.753153788571429

00:00:58.436 --> 00:01:00.476 Division of Sleep and circadian rhythm
NOTE Confidence: 0.753153788571429

00:01:00.476 --> 00:01:02.476 disorders at Harvard Medical School,

NOTE Confidence: 0.753153788571429
00:01:02.480 --> 00:01:04.615 and he's director of the Sleep apnea.
NOTE Confidence: 0.753153788571429
00:01:04.620 --> 00:01:06.104 Health Outcomes Research Group
NOTE Confidence: 0.753153788571429
00:01:06.104 --> 00:01:07.588 at Brigham Women's Hospital.
NOTE Confidence: 0.753153788571429
00:01:07.590 --> 00:01:10.722 He's written multiple algorithms to help
NOTE Confidence: 0.753153788571429
00:01:10.722 --> 00:01:12.810 improve characterization and diagnosis
NOTE Confidence: 0.753153788571429
00:01:12.880 --> 00:01:15.220 of obstructive sleep apnea and to
NOTE Confidence: 0.753153788571429
00:01:15.220 --> 00:01:17.282 help identify patients at heightened
NOTE Confidence: 0.753153788571429
00:01:17.282 --> 00:01:19.886 risk of morbidity from sleep apnea.
NOTE Confidence: 0.753153788571429
00:01:19.890 --> 00:01:22.781 He's really paved the way for precision
NOTE Confidence: 0.753153788571429
00:01:22.781 --> 00:01:25.229 medicine and sleep apnea treatment.
NOTE Confidence: 0.753153788571429
00:01:25.230 --> 00:01:29.332 He has many publications and and grants
NOTE Confidence: 0.753153788571429
00:01:29.332 --> 00:01:32.476 including two R1 and R2154 original peer
NOTE Confidence: 0.753153788571429
00:01:32.476 --> 00:01:34.408 reviewed papers and high impact journals.
NOTE Confidence: 0.753153788571429
00:01:34.410 --> 00:01:34.776 So.
NOTE Confidence: 0.753153788571429
00:01:34.776 --> 00:01:36.972 It's really a treat to have
NOTE Confidence: 0.753153788571429

00:01:36.972 --> 00:01:38.670 him join us today.
NOTE Confidence: 0.753153788571429

00:01:38.670 --> 00:01:39.762 And without further ado,
NOTE Confidence: 0.753153788571429

00:01:39.762 --> 00:01:41.760 I'll hand it over to you, Ali.
NOTE Confidence: 0.893552317894737

00:01:43.430 --> 00:01:46.142 OK. Thank you so good for inviting me
NOTE Confidence: 0.893552317894737

00:01:46.142 --> 00:01:49.193 to share my research and thanks for
NOTE Confidence: 0.893552317894737

00:01:49.193 --> 00:01:53.538 thanks everyone for attending my talk so.
NOTE Confidence: 0.893552317894737

00:01:53.540 --> 00:01:56.708 Can you see my slides and hear my voice?
NOTE Confidence: 0.76740944875

00:01:58.440 --> 00:02:01.384 Yes, but you, yeah, and it's in presentation.
NOTE Confidence: 0.777362905263158

00:02:01.740 --> 00:02:06.156 OK, great. So the title of my talk
NOTE Confidence: 0.777362905263158

00:02:06.156 --> 00:02:09.216 is understanding sleep apnea beyond
NOTE Confidence: 0.777362905263158

00:02:09.216 --> 00:02:12.900 the apnea hypopnea index or HIV.
NOTE Confidence: 0.777362905263158

00:02:12.900 --> 00:02:15.708 So this slide shows my disclosure.
NOTE Confidence: 0.777362905263158

00:02:15.710 --> 00:02:18.694 I just give you a few seconds to.
NOTE Confidence: 0.777362905263158

00:02:18.700 --> 00:02:22.116 Taking note of the numbers if you want.
NOTE Confidence: 0.777362905263158

00:02:22.120 --> 00:02:23.428 And then I'll continue.
NOTE Confidence: 0.782202970625

00:02:27.890 --> 00:02:30.746 OK, great. So I'll add the the this

NOTE Confidence: 0.782202970625

00:02:30.746 --> 00:02:34.146 slide is actually the outline of my talk.

NOTE Confidence: 0.782202970625

00:02:34.150 --> 00:02:36.740 I'll talk about the background.

NOTE Confidence: 0.782202970625

00:02:36.740 --> 00:02:38.996 And the rationale for?

NOTE Confidence: 0.782202970625

00:02:38.996 --> 00:02:40.688 Developing new metrics,

NOTE Confidence: 0.782202970625

00:02:40.690 --> 00:02:42.840 you know, in sleep apnea.

NOTE Confidence: 0.782202970625

00:02:42.840 --> 00:02:45.885 And then I'll review the hypoxic burden

NOTE Confidence: 0.782202970625

00:02:45.885 --> 00:02:49.667 and and and talk about its determinants.

NOTE Confidence: 0.782202970625

00:02:49.670 --> 00:02:50.950 Then I'll talk to you.

NOTE Confidence: 0.782202970625

00:02:50.950 --> 00:02:53.026 I'll talk about the heart rate

NOTE Confidence: 0.782202970625

00:02:53.026 --> 00:02:54.885 response to respiratory events and

NOTE Confidence: 0.782202970625

00:02:54.885 --> 00:02:58.210 it's importance and if I have time.

NOTE Confidence: 0.782202970625

00:02:58.210 --> 00:02:59.428 At the end of my talk,

NOTE Confidence: 0.782202970625

00:02:59.430 --> 00:03:02.097 I'll talk about the EEG arousals and

NOTE Confidence: 0.782202970625

00:03:02.097 --> 00:03:04.399 their relevance for risk prediction.

NOTE Confidence: 0.805547105

00:03:06.570 --> 00:03:11.230 So this, I'm sure many of you know, you know,

NOTE Confidence: 0.805547105

00:03:11.230 --> 00:03:13.330 obstructive sleep apnea better than I do,
NOTE Confidence: 0.805547105

00:03:13.330 --> 00:03:15.946 but I just quickly go over.
NOTE Confidence: 0.805547105

00:03:15.950 --> 00:03:17.718 The different signals that
NOTE Confidence: 0.805547105

00:03:17.718 --> 00:03:19.598 we collect during PSG.
NOTE Confidence: 0.805547105

00:03:19.598 --> 00:03:24.730 So this shows a 5 minutes PSG tracing.
NOTE Confidence: 0.805547105

00:03:24.730 --> 00:03:28.330 Of obstructive events for a
NOTE Confidence: 0.805547105

00:03:28.330 --> 00:03:30.430 patient that have service apnea.
NOTE Confidence: 0.805547105

00:03:30.430 --> 00:03:35.960 And as you see with the absence of air flow.
NOTE Confidence: 0.805547105

00:03:35.960 --> 00:03:38.732 There is an out of phase
NOTE Confidence: 0.805547105

00:03:38.732 --> 00:03:41.470 movement of thorax and abdomen.
NOTE Confidence: 0.805547105

00:03:41.470 --> 00:03:45.010 And the reduction in oxygen saturation?
NOTE Confidence: 0.805547105

00:03:45.010 --> 00:03:48.244 The end of each event is accompanied
NOTE Confidence: 0.805547105

00:03:48.244 --> 00:03:52.760 by an arousal from from sleep which.
NOTE Confidence: 0.805547105

00:03:52.760 --> 00:03:57.584 Then recovers the SP O2 back to normal.
NOTE Confidence: 0.805547105

00:03:57.590 --> 00:04:00.440 Levels and.
NOTE Confidence: 0.805547105

00:04:00.440 --> 00:04:03.090 The transitioning back to sleep

NOTE Confidence: 0.805547105

00:04:03.090 --> 00:04:05.210 is associated with collapse

NOTE Confidence: 0.805547105

00:04:05.210 --> 00:04:07.820 of upper airway and recurrent

NOTE Confidence: 0.805547105

00:04:07.820 --> 00:04:10.220 obstructive apneas during the night.

NOTE Confidence: 0.8037833164

00:04:12.580 --> 00:04:15.220 OK. And and we use a metric called

NOTE Confidence: 0.8037833164

00:04:15.220 --> 00:04:17.085 apnea hypopnea index which is

NOTE Confidence: 0.8037833164

00:04:17.085 --> 00:04:19.347 the number of apneas or complete

NOTE Confidence: 0.8037833164

00:04:19.347 --> 00:04:21.686 collapse of the airway and hypopneas.

NOTE Confidence: 0.8037833164

00:04:21.690 --> 00:04:24.408 Of the events with partial obstruction

NOTE Confidence: 0.8037833164

00:04:24.410 --> 00:04:26.104 in the airway per hour of sleep.

NOTE Confidence: 0.89763949125

00:04:28.130 --> 00:04:31.946 As you know, sleep apnea is associated with

NOTE Confidence: 0.89763949125

00:04:31.950 --> 00:04:35.130 many comorbidities and and health outcomes,

NOTE Confidence: 0.89763949125

00:04:35.130 --> 00:04:37.310 including excessive daytime sleepiness,

NOTE Confidence: 0.89763949125

00:04:37.310 --> 00:04:39.490 reduce quality of life,

NOTE Confidence: 0.89763949125

00:04:39.490 --> 00:04:42.388 impair workflow performance,

NOTE Confidence: 0.89763949125

00:04:42.390 --> 00:04:46.150 increase car accident risk and

NOTE Confidence: 0.89763949125

00:04:46.150 --> 00:04:48.406 several cardiometabolic outcomes.
NOTE Confidence: 0.89763949125

00:04:48.410 --> 00:04:51.050 And for example, in hypertension,
NOTE Confidence: 0.89763949125

00:04:51.050 --> 00:04:52.912 if you define OC as an HIV
NOTE Confidence: 0.89763949125

00:04:52.912 --> 00:04:55.048 AIDS in 5 minutes per hour,
NOTE Confidence: 0.89763949125

00:04:55.050 --> 00:04:57.130 the prevalence of OSA in
NOTE Confidence: 0.89763949125

00:04:57.130 --> 00:04:58.378 individuals with hypertension.
NOTE Confidence: 0.89763949125

00:04:58.380 --> 00:05:02.314 About 82% and it's about 30% if you
NOTE Confidence: 0.89763949125

00:05:02.314 --> 00:05:05.370 use HIV AIDS and 15 events per hour.
NOTE Confidence: 0.89763949125

00:05:05.370 --> 00:05:09.370 And similar associations with other.
NOTE Confidence: 0.89763949125

00:05:09.370 --> 00:05:10.860 Cardiovascular diseases.
NOTE Confidence: 0.94810355

00:05:13.500 --> 00:05:16.324 However. Despite that,
NOTE Confidence: 0.94810355

00:05:16.324 --> 00:05:18.172 observational studies of CPAP
NOTE Confidence: 0.94810355

00:05:18.172 --> 00:05:20.900 showed that CPAP is beneficial.
NOTE Confidence: 0.94810355

00:05:20.900 --> 00:05:23.786 There have been several recent randomized
NOTE Confidence: 0.94810355

00:05:23.786 --> 00:05:26.830 control trial that have not been able.
NOTE Confidence: 0.94810355

00:05:26.830 --> 00:05:29.320 To detect a benefit of

NOTE Confidence: 0.94810355
00:05:29.320 --> 00:05:31.312 CPAP including save cuts.
NOTE Confidence: 0.94810355
00:05:31.320 --> 00:05:35.340 And an Isaac study from Spain.
NOTE Confidence: 0.94810355
00:05:35.340 --> 00:05:38.910 So in addition to steep adherence
NOTE Confidence: 0.94810355
00:05:38.910 --> 00:05:41.990 and other problems with the
NOTE Confidence: 0.94810355
00:05:41.990 --> 00:05:45.566 randomized control trial of of CPAP.
NOTE Confidence: 0.94810355
00:05:45.570 --> 00:05:48.186 An important reason for for now
NOTE Confidence: 0.94810355
00:05:48.186 --> 00:05:50.790 finding in in these R cities,
NOTE Confidence: 0.94810355
00:05:50.790 --> 00:05:53.472 we believe is inadequate patient selection
NOTE Confidence: 0.94810355
00:05:53.472 --> 00:05:57.030 by by indices like apnea and Putnam index.
NOTE Confidence: 0.94810355
00:05:57.030 --> 00:06:00.972 And the reason for that is HIV is a
NOTE Confidence: 0.94810355
00:06:00.972 --> 00:06:04.370 simplified metric is a frequency counter.
NOTE Confidence: 0.94810355
00:06:04.370 --> 00:06:06.750 And doesn't capture the magnitude
NOTE Confidence: 0.94810355
00:06:06.750 --> 00:06:08.654 of physiological changes that
NOTE Confidence: 0.94810355
00:06:08.654 --> 00:06:10.099 occur during sleep.
NOTE Confidence: 0.94810355
00:06:10.100 --> 00:06:12.830 And and for any given HIV,
NOTE Confidence: 0.94810355

00:06:12.830 --> 00:06:15.505 there are radiation in in
NOTE Confidence: 0.94810355

00:06:15.505 --> 00:06:16.575 event characteristics.
NOTE Confidence: 0.94810355

00:06:16.580 --> 00:06:19.232 There are differences in the air
NOTE Confidence: 0.94810355

00:06:19.232 --> 00:06:21.466 flow reduction in the number
NOTE Confidence: 0.94810355

00:06:21.466 --> 00:06:23.278 of apneas versus hypopneas.
NOTE Confidence: 0.94810355

00:06:23.280 --> 00:06:24.759 There's desaturations severity.
NOTE Confidence: 0.94810355

00:06:24.759 --> 00:06:27.717 We're missing the depths and duration
NOTE Confidence: 0.94810355

00:06:27.717 --> 00:06:30.792 of Desaturation and we also are
NOTE Confidence: 0.94810355

00:06:30.792 --> 00:06:32.486 not measuring the cardiovascular
NOTE Confidence: 0.94810355

00:06:32.486 --> 00:06:35.024 and EG acute cardiovascular and EEG
NOTE Confidence: 0.94810355

00:06:35.024 --> 00:06:36.857 responses to respiratory events
NOTE Confidence: 0.94810355

00:06:36.857 --> 00:06:39.157 including changes in heart rate,
NOTE Confidence: 0.94810355

00:06:39.160 --> 00:06:43.150 blood pressure or or egg characteristics.
NOTE Confidence: 0.94810355

00:06:43.150 --> 00:06:45.255 How about other commonly used
NOTE Confidence: 0.94810355

00:06:45.255 --> 00:06:47.360 metrics of our system variety?
NOTE Confidence: 0.94810355

00:06:47.360 --> 00:06:48.809 They unfortunately they

NOTE Confidence: 0.94810355
00:06:48.809 --> 00:06:50.258 share similar limitations.
NOTE Confidence: 0.94810355
00:06:50.260 --> 00:06:52.970 For example oxygen desaturation index.
NOTE Confidence: 0.94810355
00:06:52.970 --> 00:06:55.240 Again it's.
NOTE Confidence: 0.94810355
00:06:55.240 --> 00:06:56.900 It's a frequency counter,
NOTE Confidence: 0.94810355
00:06:56.900 --> 00:06:59.390 doesn't have the depth or duration
NOTE Confidence: 0.94810355
00:06:59.460 --> 00:07:02.980 information. Minimum saturation.
NOTE Confidence: 0.94810355
00:07:02.980 --> 00:07:05.615 It's just oversimplifies the dynamic
NOTE Confidence: 0.94810355
00:07:05.615 --> 00:07:09.117 of breathing and the saturation to just
NOTE Confidence: 0.94810355
00:07:09.117 --> 00:07:12.277 one number number for 8 hours of recording.
NOTE Confidence: 0.94810355
00:07:12.280 --> 00:07:16.210 Arousal index again is is a
NOTE Confidence: 0.94810355
00:07:16.210 --> 00:07:18.752 frequency counter doesn't consider
NOTE Confidence: 0.94810355
00:07:18.752 --> 00:07:21.216 the intensity of arousals.
NOTE Confidence: 0.94810355
00:07:21.220 --> 00:07:25.315 And one of the the better metrics is T-90,
NOTE Confidence: 0.94810355
00:07:25.320 --> 00:07:29.008 which is basically percent time below 90%.
NOTE Confidence: 0.94810355
00:07:29.008 --> 00:07:31.998 However it's based on arbitrary
NOTE Confidence: 0.94810355

00:07:31.998 --> 00:07:33.988 threshold of 90%.

NOTE Confidence: 0.94810355

00:07:33.988 --> 00:07:39.217 And it's not specific to OSA completely,

NOTE Confidence: 0.94810355

00:07:39.217 --> 00:07:44.270 it depends on baseline SPO 2 and.

NOTE Confidence: 0.94810355

00:07:44.270 --> 00:07:47.510 And and if there are other

NOTE Confidence: 0.94810355

00:07:47.510 --> 00:07:50.177 comorbidities that will affect the

NOTE Confidence: 0.94810355

00:07:50.177 --> 00:07:53.433 the value of T-90 so it may not

NOTE Confidence: 0.94810355

00:07:53.433 --> 00:07:55.650 respond to CPAP treatment.

NOTE Confidence: 0.94810355

00:07:55.650 --> 00:07:58.026 So it's the the problem with T-90 is

NOTE Confidence: 0.94810355

00:07:58.026 --> 00:08:00.499 that it's not specific to sleep apnea.

NOTE Confidence: 0.9169038083333333

00:08:03.460 --> 00:08:06.936 OK, so due to all these limitations

NOTE Confidence: 0.9169038083333333

00:08:06.936 --> 00:08:09.720 of commonly used metrics,

NOTE Confidence: 0.9169038083333333

00:08:09.720 --> 00:08:12.475 we need to better quantify

NOTE Confidence: 0.9169038083333333

00:08:12.475 --> 00:08:13.577 event characteristics.

NOTE Confidence: 0.9169038083333333

00:08:13.580 --> 00:08:16.700 What do you see on the right side?

NOTE Confidence: 0.9169038083333333

00:08:16.700 --> 00:08:20.822 Is the uh. So we we have time zero.

NOTE Confidence: 0.9169038083333333

00:08:20.830 --> 00:08:24.589 Is the end of events and we

NOTE Confidence: 0.916903808333333
00:08:24.589 --> 00:08:27.026 just overlay all the events.
NOTE Confidence: 0.916903808333333
00:08:27.026 --> 00:08:30.855 These these Gray lines as you see here
NOTE Confidence: 0.916903808333333
00:08:30.855 --> 00:08:33.984 and and we took an ensemble average
NOTE Confidence: 0.916903808333333
00:08:33.984 --> 00:08:36.939 which is the red line in the top.
NOTE Confidence: 0.916903808333333
00:08:36.940 --> 00:08:39.985 Top row you see ventilation leader per
NOTE Confidence: 0.916903808333333
00:08:39.985 --> 00:08:43.438 minute and then you have the SP O2 signal.
NOTE Confidence: 0.916903808333333
00:08:43.438 --> 00:08:46.000 In the 2nd row you have heart
NOTE Confidence: 0.916903808333333
00:08:46.092 --> 00:08:48.030 rates and systolic blood pressure.
NOTE Confidence: 0.916903808333333
00:08:48.030 --> 00:08:50.370 In this this panel I'll I'll
NOTE Confidence: 0.916903808333333
00:08:50.370 --> 00:08:52.394 talk about how this ensemble
NOTE Confidence: 0.916903808333333
00:08:52.394 --> 00:08:54.734 averaging works in the next slide,
NOTE Confidence: 0.916903808333333
00:08:54.740 --> 00:08:56.400 but as you see here,
NOTE Confidence: 0.916903808333333
00:08:56.400 --> 00:08:57.356 there are.
NOTE Confidence: 0.916903808333333
00:08:57.356 --> 00:09:00.224 A large variation in the events
NOTE Confidence: 0.916903808333333
00:09:00.224 --> 00:09:02.671 characteristics and both within and
NOTE Confidence: 0.916903808333333

00:09:02.671 --> 00:09:05.491 between subjects and with with apnea
NOTE Confidence: 0.9169038083333333

00:09:05.491 --> 00:09:08.727 hypopnea index and other metrics we were
NOTE Confidence: 0.9169038083333333

00:09:08.727 --> 00:09:13.170 missing all this important information.
NOTE Confidence: 0.9169038083333333

00:09:13.170 --> 00:09:15.882 Information like events related events into
NOTE Confidence: 0.9169038083333333

00:09:15.882 --> 00:09:18.971 deficit which we call it when something
NOTE Confidence: 0.9169038083333333

00:09:18.971 --> 00:09:22.138 better than event related hypoxemia,
NOTE Confidence: 0.9169038083333333

00:09:22.138 --> 00:09:23.710 hypoxic burden.
NOTE Confidence: 0.9169038083333333

00:09:23.710 --> 00:09:26.006 And eventually the changes in heart rate,
NOTE Confidence: 0.9169038083333333

00:09:26.010 --> 00:09:29.256 blood pressure which can be used
NOTE Confidence: 0.9169038083333333

00:09:29.256 --> 00:09:31.867 to quantify autonomic arousals and
NOTE Confidence: 0.9169038083333333

00:09:31.867 --> 00:09:34.996 event related changes in each G like
NOTE Confidence: 0.9169038083333333

00:09:34.996 --> 00:09:37.500 metrics like arousal intensity.
NOTE Confidence: 0.9169038083333333

00:09:37.500 --> 00:09:40.224 So we are missing all this
NOTE Confidence: 0.9169038083333333

00:09:40.224 --> 00:09:41.586 information from PSG.
NOTE Confidence: 0.9169038083333333

00:09:41.590 --> 00:09:44.572 So I'll be talking about hypoxic
NOTE Confidence: 0.9169038083333333

00:09:44.572 --> 00:09:47.420 burden in this next section.

NOTE Confidence: 0.916903808333333
00:09:47.420 --> 00:09:53.220 So this this graph we have air flow.
NOTE Confidence: 0.916903808333333
00:09:53.220 --> 00:09:56.040 Here on the top and then
NOTE Confidence: 0.916903808333333
00:09:56.040 --> 00:09:57.920 we have tidal volume.
NOTE Confidence: 0.916903808333333
00:09:57.920 --> 00:09:59.024 We have SP,
NOTE Confidence: 0.916903808333333
00:09:59.024 --> 00:10:02.799 O2 signals and in EKG at the bottom here,
NOTE Confidence: 0.916903808333333
00:10:02.800 --> 00:10:06.202 so I'm just going through the algorithm
NOTE Confidence: 0.916903808333333
00:10:06.202 --> 00:10:08.872 and how we developed algorithm.
NOTE Confidence: 0.916903808333333
00:10:08.872 --> 00:10:14.280 And the marking on the top the the red.
NOTE Confidence: 0.916903808333333
00:10:14.280 --> 00:10:18.480 Rectangles. They're hypopneas.
NOTE Confidence: 0.916903808333333
00:10:18.480 --> 00:10:20.976 That were manually scored
NOTE Confidence: 0.916903808333333
00:10:20.976 --> 00:10:24.720 for this period of the PSG.
NOTE Confidence: 0.916903808333333
00:10:24.720 --> 00:10:26.603 So one way to measure the burden
NOTE Confidence: 0.916903808333333
00:10:26.603 --> 00:10:29.451 of OC is to just measure the area
NOTE Confidence: 0.916903808333333
00:10:29.451 --> 00:10:31.027 under the desaturation curve.
NOTE Confidence: 0.916903808333333
00:10:31.030 --> 00:10:34.518 As you see here.
NOTE Confidence: 0.916903808333333

00:10:34.520 --> 00:10:36.476 But sometimes it's difficult to really
NOTE Confidence: 0.9169038083333333

00:10:36.476 --> 00:10:39.100 find the start and end of this situation.
NOTE Confidence: 0.9169038083333333

00:10:39.100 --> 00:10:41.320 So we because of that we
NOTE Confidence: 0.9169038083333333

00:10:41.320 --> 00:10:44.229 designed a a search window.
NOTE Confidence: 0.9169038083333333

00:10:44.230 --> 00:10:47.205 And we defined a local 200 second
NOTE Confidence: 0.9169038083333333

00:10:47.205 --> 00:10:49.725 window surrounding the end of the
NOTE Confidence: 0.9169038083333333

00:10:49.725 --> 00:10:52.270 respiratory events as you see here.
NOTE Confidence: 0.9169038083333333

00:10:52.270 --> 00:10:56.230 And so and and why we choose 102nd?
NOTE Confidence: 0.9169038083333333

00:10:56.230 --> 00:10:58.555 Because usually it's 100 seconds
NOTE Confidence: 0.9169038083333333

00:10:58.555 --> 00:11:01.595 longer than the longest events and and
NOTE Confidence: 0.9169038083333333

00:11:01.595 --> 00:11:04.131 and that's why we use for a second.
NOTE Confidence: 0.9169038083333333

00:11:04.140 --> 00:11:07.398 So you have this for this event you have
NOTE Confidence: 0.9169038083333333

00:11:07.398 --> 00:11:11.126 this 202nd and then you go to the next event.
NOTE Confidence: 0.9169038083333333

00:11:11.130 --> 00:11:14.098 And you do the same and you keep
NOTE Confidence: 0.9169038083333333

00:11:14.098 --> 00:11:17.220 going until you cover all the
NOTE Confidence: 0.9169038083333333

00:11:17.220 --> 00:11:19.420 events during the sleep.

NOTE Confidence: 0.916903808333333
00:11:19.420 --> 00:11:20.704 At the end,
NOTE Confidence: 0.916903808333333
00:11:20.704 --> 00:11:24.228 so we all the events were aligned based
NOTE Confidence: 0.916903808333333
00:11:24.228 --> 00:11:28.370 on the end of each event which is times 0.
NOTE Confidence: 0.916903808333333
00:11:28.370 --> 00:11:30.386 So we just put everything on
NOTE Confidence: 0.916903808333333
00:11:30.386 --> 00:11:31.730 top of each other.
NOTE Confidence: 0.916903808333333
00:11:31.730 --> 00:11:35.809 And did an ensemble averaging to
NOTE Confidence: 0.916903808333333
00:11:35.809 --> 00:11:39.823 get an idea of average behavior
NOTE Confidence: 0.916903808333333
00:11:39.823 --> 00:11:42.640 or average desaturation curve.
NOTE Confidence: 0.916903808333333
00:11:42.640 --> 00:11:44.116 For for each subject,
NOTE Confidence: 0.916903808333333
00:11:44.116 --> 00:11:46.330 so it's a subject specific search
NOTE Confidence: 0.916903808333333
00:11:46.404 --> 00:11:48.864 window that we used to calculate
NOTE Confidence: 0.916903808333333
00:11:48.864 --> 00:11:50.094 the hypothesis period.
NOTE Confidence: 0.916903808333333
00:11:50.100 --> 00:11:52.494 So once we have the search window,
NOTE Confidence: 0.916903808333333
00:11:52.500 --> 00:11:54.186 we go to each respective events
NOTE Confidence: 0.916903808333333
00:11:54.186 --> 00:11:56.156 and we have this time information
NOTE Confidence: 0.916903808333333

00:11:56.156 --> 00:11:57.720 from the search window.
NOTE Confidence: 0.8574826

00:11:57.720 --> 00:12:01.108 And then we calculate the area under
NOTE Confidence: 0.8574826

00:12:01.108 --> 00:12:04.977 the curve for each each event and then
NOTE Confidence: 0.8574826

00:12:04.980 --> 00:12:08.291 the hypoxic burden will be the total
NOTE Confidence: 0.8574826

00:12:08.291 --> 00:12:11.348 area divided by total sleep time.
NOTE Confidence: 0.8574826

00:12:11.350 --> 00:12:13.080 So there have been some
NOTE Confidence: 0.8574826

00:12:13.080 --> 00:12:14.810 similar metrics in the past.
NOTE Confidence: 0.8574826

00:12:14.810 --> 00:12:17.768 However, there are some key differences.
NOTE Confidence: 0.8574826

00:12:17.770 --> 00:12:20.248 For example, some of them were they
NOTE Confidence: 0.8574826

00:12:20.248 --> 00:12:22.619 were based on the desaturation.
NOTE Confidence: 0.8574826

00:12:22.620 --> 00:12:25.962 Ohh 24% and that this session
NOTE Confidence: 0.8574826

00:12:25.962 --> 00:12:28.888 desaturation were not linked to
NOTE Confidence: 0.8574826

00:12:28.888 --> 00:12:31.656 respiratory events and there were.
NOTE Confidence: 0.8574826

00:12:31.656 --> 00:12:33.588 They require visual detection
NOTE Confidence: 0.8574826

00:12:33.588 --> 00:12:37.450 of of incomplete recovery, so.
NOTE Confidence: 0.8574826

00:12:37.450 --> 00:12:40.208 So we tried to to resolve all

NOTE Confidence: 0.8574826

00:12:40.208 --> 00:12:43.052 all all these issues with with

NOTE Confidence: 0.8574826

00:12:43.052 --> 00:12:45.144 the development of 556.

NOTE Confidence: 0.8574826

00:12:45.150 --> 00:12:47.936 So this graph that you see here.

NOTE Confidence: 0.8574826

00:12:47.940 --> 00:12:50.982 On the X axis we have apnea hypopnea index

NOTE Confidence: 0.8574826

00:12:50.982 --> 00:12:54.118 and on the Y axis we have hypoxic burden.

NOTE Confidence: 0.8574826

00:12:54.120 --> 00:12:56.718 As you see there is substantial

NOTE Confidence: 0.8574826

00:12:56.718 --> 00:12:58.840 variability for any given HIV.

NOTE Confidence: 0.8574826

00:12:58.840 --> 00:12:59.992 For example,

NOTE Confidence: 0.8574826

00:12:59.992 --> 00:13:04.800 HIV of 30 hypoxia and go from

NOTE Confidence: 0.8574826

00:13:04.800 --> 00:13:08.408 50 to 150% minute per hour.

NOTE Confidence: 0.8574826

00:13:08.408 --> 00:13:11.464 So and hypoxic pattern of 50%

NOTE Confidence: 0.8574826

00:13:11.464 --> 00:13:13.320 minute per hour means.

NOTE Confidence: 0.8574826

00:13:13.320 --> 00:13:16.843 A 10 minute per hour of 5% desaturation.

NOTE Confidence: 0.8574826

00:13:16.843 --> 00:13:22.227 That's how we can interpret the values of.

NOTE Confidence: 0.8574826

00:13:22.230 --> 00:13:26.442 And here I'm showing the the

NOTE Confidence: 0.8574826

00:13:26.442 --> 00:13:30.330 ensemble average desaturation curve.
NOTE Confidence: 0.8574826

00:13:30.330 --> 00:13:32.134 For six different subjects,
NOTE Confidence: 0.8574826

00:13:32.134 --> 00:13:35.570 so you you see the HIV values.
NOTE Confidence: 0.8574826

00:13:35.570 --> 00:13:38.615 On the top and then hypoxic and
NOTE Confidence: 0.8574826

00:13:38.615 --> 00:13:40.670 values have just below below
NOTE Confidence: 0.8574826

00:13:40.670 --> 00:13:43.740 the HIV and you see the spike.
NOTE Confidence: 0.8574826

00:13:43.740 --> 00:13:46.068 The severity of desaturation.
NOTE Confidence: 0.8574826

00:13:46.068 --> 00:13:49.560 All these subjects have similar ages.
NOTE Confidence: 0.8574826

00:13:49.560 --> 00:13:50.025 Well,
NOTE Confidence: 0.8574826

00:13:50.025 --> 00:13:52.815 there's different patterns of the saturation,
NOTE Confidence: 0.8574826

00:13:52.820 --> 00:13:58.200 so it's it's important to.
NOTE Confidence: 0.8574826

00:13:58.200 --> 00:14:01.080 To try to better vectorize the
NOTE Confidence: 0.8574826

00:14:01.080 --> 00:14:03.725 their sporting events and and get
NOTE Confidence: 0.8574826

00:14:03.725 --> 00:14:06.938 the Disat area of of of the events
NOTE Confidence: 0.8574826

00:14:06.938 --> 00:14:09.890 and and measure the hypoxic event.
NOTE Confidence: 0.8574826

00:14:09.890 --> 00:14:10.548 Uh.

NOTE Confidence: 0.8574826

00:14:10.548 --> 00:14:13.180 Because it's it's better,

NOTE Confidence: 0.8574826

00:14:13.180 --> 00:14:15.609 it's a better metrics of of our

NOTE Confidence: 0.8574826

00:14:15.609 --> 00:14:17.494 system ability than just counting

NOTE Confidence: 0.8574826

00:14:17.494 --> 00:14:20.740 the number of events so.

NOTE Confidence: 0.8574826

00:14:20.740 --> 00:14:22.048 In this figure,

NOTE Confidence: 0.8574826

00:14:22.048 --> 00:14:25.100 I'm showing the T-90 on the X

NOTE Confidence: 0.8574826

00:14:25.197 --> 00:14:28.200 axis and hypoxic on the Y axis.

NOTE Confidence: 0.8574826

00:14:28.200 --> 00:14:33.216 So there are some subjects here.

NOTE Confidence: 0.8574826

00:14:33.220 --> 00:14:34.048 Uh,

NOTE Confidence: 0.8574826

00:14:34.048 --> 00:14:38.413 with a high T-90 but a low

NOTE Confidence: 0.8574826

00:14:38.413 --> 00:14:39.817 value of hypoxic period,

NOTE Confidence: 0.8574826

00:14:39.820 --> 00:14:42.892 these are these are the subsequent

NOTE Confidence: 0.8574826

00:14:42.892 --> 00:14:45.780 sustained hypoxemia as opposed to

NOTE Confidence: 0.8574826

00:14:45.780 --> 00:14:48.260 a related intermittent hypoxemia.

NOTE Confidence: 0.8574826

00:14:48.260 --> 00:14:50.828 And and the interesting part is

NOTE Confidence: 0.8574826

00:14:50.828 --> 00:14:54.515 that T-90 when T-90 is close to 0.
NOTE Confidence: 0.8574826

00:14:54.520 --> 00:14:56.485 There is a wide variation
NOTE Confidence: 0.8574826

00:14:56.485 --> 00:14:58.057 in the hypoxic burden.
NOTE Confidence: 0.8574826

00:14:58.060 --> 00:14:59.380 So for many,
NOTE Confidence: 0.8574826

00:14:59.380 --> 00:15:00.260 many subjects,
NOTE Confidence: 0.8574826

00:15:00.260 --> 00:15:03.300 the T-90 really doesn't capture
NOTE Confidence: 0.8574826

00:15:03.300 --> 00:15:05.360 the the intermittent hypoxia that
NOTE Confidence: 0.8574826

00:15:05.360 --> 00:15:07.420 we were captured with hypoxia.
NOTE Confidence: 0.806801286153846

00:15:10.140 --> 00:15:12.842 So we we have done several analysis
NOTE Confidence: 0.806801286153846

00:15:12.842 --> 00:15:16.162 to show the importance of hypoxic and
NOTE Confidence: 0.806801286153846

00:15:16.162 --> 00:15:19.270 the first was the association between
NOTE Confidence: 0.806801286153846

00:15:19.356 --> 00:15:22.728 hypoxic burden and CVD related mortality.
NOTE Confidence: 0.806801286153846

00:15:22.730 --> 00:15:26.424 We use 2. Observation observational
NOTE Confidence: 0.806801286153846

00:15:26.424 --> 00:15:30.565 cohorts Mr Oz and Stephen House Mr
NOTE Confidence: 0.806801286153846

00:15:30.565 --> 00:15:33.400 Oz older men average age of about
NOTE Confidence: 0.806801286153846

00:15:33.400 --> 00:15:36.609 76 years and they were followed for

NOTE Confidence: 0.806801286153846
00:15:36.609 --> 00:15:40.178 about 10 years and there were 440 CVD
NOTE Confidence: 0.806801286153846
00:15:40.178 --> 00:15:42.632 related deaths and the Sleep Heart
NOTE Confidence: 0.806801286153846
00:15:42.632 --> 00:15:45.459 House we have both men and women.
NOTE Confidence: 0.806801286153846
00:15:45.460 --> 00:15:49.285 And the H younger lady longer 64
NOTE Confidence: 0.806801286153846
00:15:49.285 --> 00:15:51.895 year old on average followed for
NOTE Confidence: 0.806801286153846
00:15:51.895 --> 00:15:55.388 about 11 years 313 CBT related death.
NOTE Confidence: 0.806801286153846
00:15:55.388 --> 00:15:59.834 And what we showed that so we there was
NOTE Confidence: 0.806801286153846
00:15:59.834 --> 00:16:02.390 a those are some response relationship
NOTE Confidence: 0.806801286153846
00:16:02.478 --> 00:16:07.058 with the severity of hypoxic burden and and.
NOTE Confidence: 0.806801286153846
00:16:07.060 --> 00:16:09.394 And increased risk of CVD mortality
NOTE Confidence: 0.806801286153846
00:16:09.394 --> 00:16:10.950 in these two cohorts.
NOTE Confidence: 0.87653863
00:16:13.510 --> 00:16:16.506 We then did some analysis with incident
NOTE Confidence: 0.87653863
00:16:16.506 --> 00:16:19.068 heart failure and as you see here,
NOTE Confidence: 0.87653863
00:16:19.070 --> 00:16:21.235 I'm comparing HIV versus hypoxic
NOTE Confidence: 0.87653863
00:16:21.235 --> 00:16:24.788 burden and you see a clear dose
NOTE Confidence: 0.87653863

00:16:24.788 --> 00:16:27.926 response relationship between if you

NOTE Confidence: 0.87653863

00:16:27.926 --> 00:16:31.454 use hypoxic burn compared to HIV.

NOTE Confidence: 0.87653863

00:16:31.460 --> 00:16:33.596 And this figure on the left,

NOTE Confidence: 0.87653863

00:16:33.600 --> 00:16:36.740 bottom left is is interesting.

NOTE Confidence: 0.87653863

00:16:36.740 --> 00:16:39.044 What we did here was a

NOTE Confidence: 0.87653863

00:16:39.044 --> 00:16:40.196 secondary exploratory analysis.

NOTE Confidence: 0.87653863

00:16:40.200 --> 00:16:42.700 We categorized individuals into

NOTE Confidence: 0.87653863

00:16:42.700 --> 00:16:46.450 low hypoxic burden and low HIV,

NOTE Confidence: 0.87653863

00:16:46.450 --> 00:16:48.580 which was our reference group.

NOTE Confidence: 0.87653863

00:16:48.580 --> 00:16:50.280 And then low hypoxic burn,

NOTE Confidence: 0.87653863

00:16:50.280 --> 00:16:53.060 higher HI, higher hypoxic burn

NOTE Confidence: 0.87653863

00:16:53.060 --> 00:16:57.259 and low HIV and high hypoxic IHI.

NOTE Confidence: 0.87653863

00:16:57.260 --> 00:16:59.672 And as you see here regardless

NOTE Confidence: 0.87653863

00:16:59.672 --> 00:17:01.720 of the level of HIV,

NOTE Confidence: 0.87653863

00:17:01.720 --> 00:17:04.885 high hypoxic burden were associated

NOTE Confidence: 0.87653863

00:17:04.885 --> 00:17:08.644 with increased risk was while if

NOTE Confidence: 0.87653863

00:17:08.644 --> 00:17:11.566 you have low hypoxylon and high,

NOTE Confidence: 0.87653863

00:17:11.570 --> 00:17:14.438 it's really there was no association

NOTE Confidence: 0.87653863

00:17:14.438 --> 00:17:16.450 with with instance or failure.

NOTE Confidence: 0.71771866

00:17:18.510 --> 00:17:24.480 And. So a study, a clinical cohort.

NOTE Confidence: 0.71771866

00:17:24.480 --> 00:17:27.686 In in that. From France,

NOTE Confidence: 0.71771866

00:17:27.686 --> 00:17:31.064 they actually tested hypoxic burden on.

NOTE Confidence: 0.71771866

00:17:31.070 --> 00:17:32.554 On our clinical cohort,

NOTE Confidence: 0.71771866

00:17:32.554 --> 00:17:35.288 I think it was HIV written five

NOTE Confidence: 0.71771866

00:17:35.288 --> 00:17:38.334 they included only and there were

NOTE Confidence: 0.71771866

00:17:38.334 --> 00:17:43.170 immediate follow up about 78 months.

NOTE Confidence: 0.71771866

00:17:43.170 --> 00:17:45.690 5400 patients with OSA

NOTE Confidence: 0.71771866

00:17:45.690 --> 00:17:48.210 and without CD baseline.

NOTE Confidence: 0.71771866

00:17:48.210 --> 00:17:51.354 And they had a composite outcome

NOTE Confidence: 0.71771866

00:17:51.354 --> 00:17:53.840 of all cosmetology or CD.

NOTE Confidence: 0.71771866

00:17:53.840 --> 00:17:56.900 And they they saw a similar

NOTE Confidence: 0.71771866

00:17:56.900 --> 00:17:58.984 association with hypoxia and.
NOTE Confidence: 0.71771866

00:17:58.984 --> 00:18:01.754 And and the outcomes that
NOTE Confidence: 0.71771866

00:18:01.754 --> 00:18:05.490 they were investigating so.
NOTE Confidence: 0.71771866

00:18:05.490 --> 00:18:09.025 Oh, we did some cross-sectional
NOTE Confidence: 0.71771866

00:18:09.025 --> 00:18:11.434 analysis in Mesa study.
NOTE Confidence: 0.71771866

00:18:11.434 --> 00:18:14.913 And we looked at hypoxic burden and
NOTE Confidence: 0.71771866

00:18:14.913 --> 00:18:17.911 blood pressure and also hypoxic
NOTE Confidence: 0.71771866

00:18:17.911 --> 00:18:21.511 period and chronic kidney disease and.
NOTE Confidence: 0.71771866

00:18:21.520 --> 00:18:23.086 So these are the two studies
NOTE Confidence: 0.71771866

00:18:23.086 --> 00:18:24.511 that showed hypoxic pattern was
NOTE Confidence: 0.71771866

00:18:24.511 --> 00:18:25.819 associated with blood pressure,
NOTE Confidence: 0.71771866

00:18:25.820 --> 00:18:27.156 increased blood pressure and
NOTE Confidence: 0.71771866

00:18:27.156 --> 00:18:28.158 hypoxic term was.
NOTE Confidence: 0.71771866

00:18:28.160 --> 00:18:30.998 So it's associated with higher prevalence
NOTE Confidence: 0.71771866

00:18:30.998 --> 00:18:34.250 ratios of moderate to severe CKD.
NOTE Confidence: 0.870743134545454

00:18:37.490 --> 00:18:40.742 There have been other studies actually

NOTE Confidence: 0.870743134545454
00:18:40.742 --> 00:18:43.720 that looked at similar metrics.
NOTE Confidence: 0.870743134545454
00:18:43.720 --> 00:18:46.720 In the last two years and
NOTE Confidence: 0.870743134545454
00:18:46.720 --> 00:18:49.390 what they found was that.
NOTE Confidence: 0.870743134545454
00:18:49.390 --> 00:18:52.568 For example, this this metric which is
NOTE Confidence: 0.870743134545454
00:18:52.568 --> 00:18:55.269 called sleep breathing impairment index.
NOTE Confidence: 0.870743134545454
00:18:55.270 --> 00:18:57.890 Similar metric was associated with
NOTE Confidence: 0.870743134545454
00:18:57.890 --> 00:19:03.380 cardiovascular risk in male patients and.
NOTE Confidence: 0.870743134545454
00:19:03.380 --> 00:19:05.980 Also some association with daytime
NOTE Confidence: 0.870743134545454
00:19:05.980 --> 00:19:08.584 sleepiness better than HIV and
NOTE Confidence: 0.870743134545454
00:19:08.584 --> 00:19:10.680 and some neurocognitive outcomes.
NOTE Confidence: 0.870743134545454
00:19:10.680 --> 00:19:13.640 Here PVD based reaction time
NOTE Confidence: 0.870743134545454
00:19:13.640 --> 00:19:16.008 and severity of desaturation.
NOTE Confidence: 0.870743134545454
00:19:16.010 --> 00:19:18.356 So there have been some other
NOTE Confidence: 0.870743134545454
00:19:18.356 --> 00:19:20.750 studies that have been interested
NOTE Confidence: 0.870743134545454
00:19:20.750 --> 00:19:23.038 in Desaturation area under the
NOTE Confidence: 0.870743134545454

00:19:23.038 --> 00:19:25.690 curve and show some some significant

NOTE Confidence: 0.870743134545454

00:19:25.690 --> 00:19:27.410 association with these outcomes.

NOTE Confidence: 0.766603007333333

00:19:30.420 --> 00:19:33.975 OK, so now here I would like to talk

NOTE Confidence: 0.766603007333333

00:19:33.975 --> 00:19:37.390 about the terminal of hypoxic Berlin.

NOTE Confidence: 0.766603007333333

00:19:37.390 --> 00:19:41.615 So. Hypoxic burden in in sleep

NOTE Confidence: 0.766603007333333

00:19:41.615 --> 00:19:44.331 apnea is mostly related to reduced

NOTE Confidence: 0.766603007333333

00:19:44.331 --> 00:19:47.180 ventilation due to OSA. However.

NOTE Confidence: 0.849441861

00:19:49.190 --> 00:19:51.580 A recent research letter that

NOTE Confidence: 0.849441861

00:19:51.580 --> 00:19:53.970 was published in Blue Journal.

NOTE Confidence: 0.849441861

00:19:53.970 --> 00:19:57.205 They argued about the the

NOTE Confidence: 0.849441861

00:19:57.205 --> 00:19:59.793 contribution of abdominal obesity.

NOTE Confidence: 0.849441861

00:19:59.800 --> 00:20:02.626 To hypoxic burden.

NOTE Confidence: 0.849441861

00:20:02.626 --> 00:20:08.100 And and so and the lack of.

NOTE Confidence: 0.849441861

00:20:08.100 --> 00:20:10.056 Appropriate adjustment for abdominal

NOTE Confidence: 0.849441861

00:20:10.056 --> 00:20:13.780 obesity in these studies that we have done.

NOTE Confidence: 0.849441861

00:20:13.780 --> 00:20:17.077 So the argument was that this abdominal

NOTE Confidence: 0.849441861

00:20:17.080 --> 00:20:20.680 obesity leads to a reduced FRC,

NOTE Confidence: 0.849441861

00:20:20.680 --> 00:20:23.596 which leads to decreased baseline SP

NOTE Confidence: 0.849441861

00:20:23.596 --> 00:20:27.439 O2 and faster and deeper desaturation.

NOTE Confidence: 0.849441861

00:20:27.440 --> 00:20:29.580 Independent of ventilatory decrease,

NOTE Confidence: 0.849441861

00:20:29.580 --> 00:20:32.790 which is related to sleep apnea.

NOTE Confidence: 0.915711231666667

00:20:35.310 --> 00:20:39.690 So just trying to clarify more.

NOTE Confidence: 0.915711231666667

00:20:39.690 --> 00:20:42.510 Assume that we have two subjects.

NOTE Confidence: 0.915711231666667

00:20:42.510 --> 00:20:45.274 With similar OSA severity

NOTE Confidence: 0.915711231666667

00:20:45.274 --> 00:20:48.038 but different hypoxic burden.

NOTE Confidence: 0.915711231666667

00:20:48.040 --> 00:20:52.312 So what you see here is the ensemble

NOTE Confidence: 0.915711231666667

00:20:52.312 --> 00:20:54.840 average curve of. Ventilation.

NOTE Confidence: 0.769331416470588

00:20:56.870 --> 00:20:59.622 And the hi is 30 and 30 burden

NOTE Confidence: 0.769331416470588

00:20:59.622 --> 00:21:02.672 which is basically the area on the

NOTE Confidence: 0.769331416470588

00:21:02.672 --> 00:21:05.530 total area under ventilatory curve.

NOTE Confidence: 0.769331416470588

00:21:05.530 --> 00:21:09.430 During sleep per hour of sleep.

NOTE Confidence: 0.769331416470588

00:21:09.430 --> 00:21:11.270 And so this, this,
NOTE Confidence: 0.769331416470588

00:21:11.270 --> 00:21:14.030 this mentality burden leads to a
NOTE Confidence: 0.769331416470588

00:21:14.121 --> 00:21:17.726 hypothetical for this particular subject
NOTE Confidence: 0.769331416470588

00:21:17.730 --> 00:21:20.813 leads to hypoxic permanent about 83%
NOTE Confidence: 0.769331416470588

00:21:20.813 --> 00:21:23.424 minute per hour, as you see here.
NOTE Confidence: 0.769331416470588

00:21:23.430 --> 00:21:25.940 Assume that we have a.
NOTE Confidence: 0.769331416470588

00:21:25.940 --> 00:21:27.920 We have another subject
NOTE Confidence: 0.769331416470588

00:21:27.920 --> 00:21:30.251 with exactly the same age.
NOTE Confidence: 0.769331416470588

00:21:30.251 --> 00:21:33.059 The same age are the same entity Berlin,
NOTE Confidence: 0.769331416470588

00:21:33.060 --> 00:21:35.880 but with a lower hypoxic Berlin.
NOTE Confidence: 0.769331416470588

00:21:35.880 --> 00:21:39.968 So the argument that was done in.
NOTE Confidence: 0.769331416470588

00:21:39.970 --> 00:21:42.520 In in the this research letter
NOTE Confidence: 0.769331416470588

00:21:42.520 --> 00:21:45.310 was that this subject here in the
NOTE Confidence: 0.769331416470588

00:21:45.310 --> 00:21:47.250 top with higher hypoxic Berlin.
NOTE Confidence: 0.769331416470588

00:21:47.250 --> 00:21:49.980 Has a lower.
NOTE Confidence: 0.769331416470588

00:21:49.980 --> 00:21:53.487 Point volume, which results to more severe,

NOTE Confidence: 0.769331416470588
00:21:53.490 --> 00:21:57.830 deeper or faster desaturation. And.
NOTE Confidence: 0.769331416470588
00:21:57.830 --> 00:22:03.045 And and we really currently don't have.
NOTE Confidence: 0.769331416470588
00:22:03.050 --> 00:22:08.000 Unless we do some city scan of of the.
NOTE Confidence: 0.769331416470588
00:22:08.000 --> 00:22:10.032 Of the visceral fat,
NOTE Confidence: 0.769331416470588
00:22:10.032 --> 00:22:12.979 we really cannot adjust for this.
NOTE Confidence: 0.769331416470588
00:22:12.979 --> 00:22:16.870 And and and and the argument was that.
NOTE Confidence: 0.769331416470588
00:22:16.870 --> 00:22:20.075 This will affect the association
NOTE Confidence: 0.769331416470588
00:22:20.075 --> 00:22:23.790 between hypercycle and and and CBD.
NOTE Confidence: 0.769331416470588
00:22:23.790 --> 00:22:26.583 So we try to answer this question
NOTE Confidence: 0.769331416470588
00:22:26.583 --> 00:22:29.429 in this study that the manuscript
NOTE Confidence: 0.769331416470588
00:22:29.429 --> 00:22:32.543 is actually under review right now.
NOTE Confidence: 0.769331416470588
00:22:32.550 --> 00:22:36.634 So we we assess the relationship
NOTE Confidence: 0.769331416470588
00:22:36.634 --> 00:22:39.214 between hypoxic burden and ventilatory
NOTE Confidence: 0.769331416470588
00:22:39.214 --> 00:22:41.650 burden as well as available measure
NOTE Confidence: 0.769331416470588
00:22:41.650 --> 00:22:43.570 of abdominal obesity and other
NOTE Confidence: 0.769331416470588

00:22:43.639 --> 00:22:46.050 confounder in in Mesa sleep study.
NOTE Confidence: 0.769331416470588

00:22:46.050 --> 00:22:49.490 They had some astrometry parameter
NOTE Confidence: 0.769331416470588

00:22:49.490 --> 00:22:53.171 in Mesa long which we used to try to
NOTE Confidence: 0.769331416470588

00:22:53.171 --> 00:22:56.957 answer this question and we separately
NOTE Confidence: 0.769331416470588

00:22:56.957 --> 00:23:00.720 tested if ventilator burden predicted CVD.
NOTE Confidence: 0.769331416470588

00:23:00.720 --> 00:23:05.658 And we also did another analysis.
NOTE Confidence: 0.769331416470588

00:23:05.660 --> 00:23:09.960 We adjusted the association of
NOTE Confidence: 0.769331416470588

00:23:09.960 --> 00:23:13.400 HBCD for desaturation sensitivity.
NOTE Confidence: 0.769331416470588

00:23:13.400 --> 00:23:16.580 And and and so the.
NOTE Confidence: 0.769331416470588

00:23:16.580 --> 00:23:18.340 The the idea behind it,
NOTE Confidence: 0.769331416470588

00:23:18.340 --> 00:23:20.516 behind this is that,
NOTE Confidence: 0.769331416470588

00:23:20.516 --> 00:23:24.402 so this subject here in the top
NOTE Confidence: 0.769331416470588

00:23:24.402 --> 00:23:26.902 will have a higher desaturation
NOTE Confidence: 0.769331416470588

00:23:26.902 --> 00:23:28.910 or tendency to desaturate.
NOTE Confidence: 0.769331416470588

00:23:28.910 --> 00:23:31.983 So we try to to adjust for
NOTE Confidence: 0.769331416470588

00:23:31.983 --> 00:23:33.770 desaturation sensitivity which was

NOTE Confidence: 0.769331416470588

00:23:33.770 --> 00:23:36.465 which we defined as the amount of

NOTE Confidence: 0.769331416470588

00:23:36.465 --> 00:23:38.940 hypoxia that you get per ventilatory

NOTE Confidence: 0.769331416470588

00:23:38.940 --> 00:23:41.100 per reduction in ventilation.

NOTE Confidence: 0.769331416470588

00:23:41.100 --> 00:23:43.746 So we adjusted this for desaturation

NOTE Confidence: 0.769331416470588

00:23:43.746 --> 00:23:46.499 sensitivity to see if it actually.

NOTE Confidence: 0.769331416470588

00:23:46.500 --> 00:23:48.975 Anything changes and if these

NOTE Confidence: 0.769331416470588

00:23:48.975 --> 00:23:51.450 situations sensitivity by itself is

NOTE Confidence: 0.769331416470588

00:23:51.529 --> 00:23:54.499 actually predictive of of the outcomes.

NOTE Confidence: 0.769331416470588

00:23:54.500 --> 00:24:00.076 So we did the study in Mesa sleep.

NOTE Confidence: 0.769331416470588

00:24:00.080 --> 00:24:03.362 Study about 1950 subjects so the

NOTE Confidence: 0.769331416470588

00:24:03.362 --> 00:24:05.550 definition of mentality burden

NOTE Confidence: 0.769331416470588

00:24:05.640 --> 00:24:08.820 which he defined it as event

NOTE Confidence: 0.769331416470588

00:24:08.820 --> 00:24:10.940 specific area under ventilation,

NOTE Confidence: 0.769331416470588

00:24:10.940 --> 00:24:12.948 ventilation signal so mean

NOTE Confidence: 0.769331416470588

00:24:12.948 --> 00:24:15.960 normalize and air we calculate the

NOTE Confidence: 0.769331416470588

00:24:16.052 --> 00:24:18.687 area under the mean ventilation.
NOTE Confidence: 0.769331416470588

00:24:18.690 --> 00:24:21.870 And the outcomes that were tested
NOTE Confidence: 0.769331416470588

00:24:21.870 --> 00:24:23.990 was instant cardiovascular disease,
NOTE Confidence: 0.769331416470588

00:24:23.990 --> 00:24:26.498 instant coronary heart heart
NOTE Confidence: 0.769331416470588

00:24:26.498 --> 00:24:29.633 disease and all cosmos totality.
NOTE Confidence: 0.769331416470588

00:24:29.640 --> 00:24:33.012 So this is briefly shows how
NOTE Confidence: 0.769331416470588

00:24:33.012 --> 00:24:35.260 we measure penalty Berlin.
NOTE Confidence: 0.769331416470588

00:24:35.260 --> 00:24:37.871 So if you look at the ensemble
NOTE Confidence: 0.769331416470588

00:24:37.871 --> 00:24:40.499 averaging of the ventilatory curve,
NOTE Confidence: 0.769331416470588

00:24:40.500 --> 00:24:43.236 so we can get the average event duration,
NOTE Confidence: 0.769331416470588

00:24:43.240 --> 00:24:46.120 we can get the event depth.
NOTE Confidence: 0.769331416470588

00:24:46.120 --> 00:24:48.706 And events to burden can simply
NOTE Confidence: 0.769331416470588

00:24:48.706 --> 00:24:51.967 be defined as the event rate times
NOTE Confidence: 0.769331416470588

00:24:51.967 --> 00:24:54.412 vent depths time event duration,
NOTE Confidence: 0.769331416470588

00:24:54.412 --> 00:24:57.884 which is a measure of total total
NOTE Confidence: 0.769331416470588

00:24:57.890 --> 00:25:01.330 ventilatory deficit during sleep.

NOTE Confidence: 0.769331416470588

00:25:01.330 --> 00:25:04.816 So this table shows the baseline

NOTE Confidence: 0.769331416470588

00:25:04.816 --> 00:25:07.140 characteristics of the Mesa

NOTE Confidence: 0.769331416470588

00:25:07.140 --> 00:25:10.910 sleep study that we included.

NOTE Confidence: 0.769331416470588

00:25:10.910 --> 00:25:17.620 So the average age about 67 year and.

NOTE Confidence: 0.769331416470588

00:25:17.620 --> 00:25:22.558 About 5053% of women.

NOTE Confidence: 0.769331416470588

00:25:22.560 --> 00:25:24.924 Equal distribution of different

NOTE Confidence: 0.769331416470588

00:25:24.924 --> 00:25:28.470 arrays and necessities and you see

NOTE Confidence: 0.796804696153846

00:25:28.565 --> 00:25:31.342 the PMI here. What we have here?

NOTE Confidence: 0.796804696153846

00:25:31.342 --> 00:25:33.760 Is that we have the HIV,

NOTE Confidence: 0.796804696153846

00:25:33.760 --> 00:25:36.567 the median HIV in this cohort was

NOTE Confidence: 0.796804696153846

00:25:36.567 --> 00:25:39.162 about 33 events per hour when

NOTE Confidence: 0.796804696153846

00:25:39.162 --> 00:25:41.402 switching Berlin and hypoxic Berlin.

NOTE Confidence: 0.796804696153846

00:25:41.410 --> 00:25:44.530 So in Mesa as just when I get a feel

NOTE Confidence: 0.796804696153846

00:25:44.626 --> 00:25:47.338 of how much rental through loss

NOTE Confidence: 0.796804696153846

00:25:47.338 --> 00:25:50.634 there was on average in this in

NOTE Confidence: 0.796804696153846

00:25:50.634 --> 00:25:53.516 this population cohort was about 20%
NOTE Confidence: 0.796804696153846

00:25:53.516 --> 00:25:57.338 was about 3 minutes of apnea which
NOTE Confidence: 0.796804696153846

00:25:57.338 --> 00:25:59.846 is the 100% reduction in airflow
NOTE Confidence: 0.796804696153846

00:25:59.846 --> 00:26:02.600 per hour of sleep and the hypoxic.
NOTE Confidence: 0.796804696153846

00:26:02.600 --> 00:26:05.146 But 9 minutes of 4% desaturation
NOTE Confidence: 0.796804696153846

00:26:05.146 --> 00:26:08.530 per hour of sleep.
NOTE Confidence: 0.796804696153846

00:26:08.530 --> 00:26:11.218 And this graph shows the association
NOTE Confidence: 0.796804696153846

00:26:11.218 --> 00:26:13.760 between ventilated burden and hypoxemia.
NOTE Confidence: 0.796804696153846

00:26:13.760 --> 00:26:16.824 You 17 burden on the X axis and
NOTE Confidence: 0.796804696153846

00:26:16.830 --> 00:26:18.966 hypoxic burden on the Y axis.
NOTE Confidence: 0.796804696153846

00:26:18.970 --> 00:26:20.570 They were strongly correlated
NOTE Confidence: 0.796804696153846

00:26:20.570 --> 00:26:25.270 and the R score was about 0.8.
NOTE Confidence: 0.796804696153846

00:26:25.270 --> 00:26:28.936 In this table I'm showing the
NOTE Confidence: 0.796804696153846

00:26:28.936 --> 00:26:31.380 contribution of other factors.
NOTE Confidence: 0.796804696153846

00:26:31.380 --> 00:26:35.608 So the Model 1 included mentality burden.
NOTE Confidence: 0.796804696153846

00:26:35.610 --> 00:26:42.420 BRS score of 0.8 in Model 2 we added a BMI.

NOTE Confidence: 0.796804696153846

00:26:42.420 --> 00:26:44.460 And and body surface area.

NOTE Confidence: 0.796804696153846

00:26:44.460 --> 00:26:48.380 So the R-squared increased only by 1%.

NOTE Confidence: 0.796804696153846

00:26:48.380 --> 00:26:51.080 Model 3 as you see here,

NOTE Confidence: 0.796804696153846

00:26:51.080 --> 00:26:53.720 we added wakefulness to baseline SPO

NOTE Confidence: 0.796804696153846

00:26:53.720 --> 00:26:56.453 2 because there was one argument

NOTE Confidence: 0.796804696153846

00:26:56.453 --> 00:26:58.166 that baseline SP O2,

NOTE Confidence: 0.796804696153846

00:26:58.166 --> 00:27:00.698 the lower the baseline the the

NOTE Confidence: 0.796804696153846

00:27:00.698 --> 00:27:03.597 deeper the saturation and that could,

NOTE Confidence: 0.796804696153846

00:27:03.600 --> 00:27:05.484 independent of ventilatory deficit,

NOTE Confidence: 0.796804696153846

00:27:05.484 --> 00:27:07.839 affect the values of hypoxic.

NOTE Confidence: 0.796804696153846

00:27:07.840 --> 00:27:13.940 And so we added. So what about 1% additional?

NOTE Confidence: 0.796804696153846

00:27:13.940 --> 00:27:16.260 Variation explained by adding

NOTE Confidence: 0.796804696153846

00:27:16.260 --> 00:27:18.580 these two variables here.

NOTE Confidence: 0.796804696153846

00:27:18.580 --> 00:27:21.988 And and and similarly in the other models

NOTE Confidence: 0.796804696153846

00:27:21.988 --> 00:27:24.622 where we did some spirometry parameters,

NOTE Confidence: 0.796804696153846

00:27:24.622 --> 00:27:29.430 so there was no change in the R square.
NOTE Confidence: 0.796804696153846

00:27:29.430 --> 00:27:32.800 So and and what what it tells us is that the.
NOTE Confidence: 0.657052881909091

00:27:34.900 --> 00:27:37.864 Did the variation in hypoxic furnace
NOTE Confidence: 0.657052881909091

00:27:37.864 --> 00:27:40.311 mostly described by reality burn
NOTE Confidence: 0.657052881909091

00:27:40.311 --> 00:27:42.627 which is the OC related component
NOTE Confidence: 0.657052881909091

00:27:42.627 --> 00:27:44.950 that we are interested in?
NOTE Confidence: 0.657052881909091

00:27:44.950 --> 00:27:47.814 So what you see here is the hypoxic
NOTE Confidence: 0.657052881909091

00:27:47.814 --> 00:27:50.097 pattern and venture burden association
NOTE Confidence: 0.657052881909091

00:27:50.097 --> 00:27:53.562 with instant CD and all Cosmo thority.
NOTE Confidence: 0.657052881909091

00:27:53.570 --> 00:27:56.074 So you have a instant CHD and this
NOTE Confidence: 0.657052881909091

00:27:56.074 --> 00:27:58.790 is a hazard ratio for hypoxia.
NOTE Confidence: 0.657052881909091

00:27:58.790 --> 00:28:02.340 Incident, CVD and all cosmetology.
NOTE Confidence: 0.657052881909091

00:28:02.340 --> 00:28:05.160 And you see a similar association
NOTE Confidence: 0.657052881909091

00:28:05.160 --> 00:28:06.570 with Renton Superman.
NOTE Confidence: 0.657052881909091

00:28:06.570 --> 00:28:09.930 And these these these hazard ratios were
NOTE Confidence: 0.657052881909091

00:28:09.930 --> 00:28:13.652 adjusted for age 6 phase BMI hypertension

NOTE Confidence: 0.657052881909091

00:28:13.652 --> 00:28:16.940 as well as the desaturation sensitivity.

NOTE Confidence: 0.657052881909091

00:28:16.940 --> 00:28:20.654 So we also adjusted for desaturation

NOTE Confidence: 0.657052881909091

00:28:20.654 --> 00:28:24.251 sensitivity to to adjust out those

NOTE Confidence: 0.657052881909091

00:28:24.251 --> 00:28:27.844 other unseen or unobserved confounders.

NOTE Confidence: 0.657052881909091

00:28:27.844 --> 00:28:32.470 That we really cannot measure in

NOTE Confidence: 0.657052881909091

00:28:32.593 --> 00:28:36.097 this large population towards.

NOTE Confidence: 0.657052881909091

00:28:36.100 --> 00:28:38.767 So the take home message is that

NOTE Confidence: 0.657052881909091

00:28:38.767 --> 00:28:40.850 hypothesis is minimally affected by

NOTE Confidence: 0.657052881909091

00:28:40.850 --> 00:28:43.025 available measure of either positive

NOTE Confidence: 0.657052881909091

00:28:43.025 --> 00:28:45.897 and lung volume and ERV do not vary

NOTE Confidence: 0.657052881909091

00:28:45.897 --> 00:28:48.270 much in OSA population the action in

NOTE Confidence: 0.657052881909091

00:28:48.346 --> 00:28:50.782 fact we looked at the coefficient

NOTE Confidence: 0.657052881909091

00:28:50.782 --> 00:28:53.744 of variation of of these different

NOTE Confidence: 0.657052881909091

00:28:53.744 --> 00:28:55.888 factors waste circumference the

NOTE Confidence: 0.657052881909091

00:28:55.888 --> 00:28:58.985 coefficient of variation was about 14%,

NOTE Confidence: 0.657052881909091

00:28:58.985 --> 00:29:02.100 BMI 19% while for rental to burden
NOTE Confidence: 0.657052881909091

00:29:02.100 --> 00:29:05.864 is was about 100% of the coefficient
NOTE Confidence: 0.657052881909091

00:29:05.864 --> 00:29:08.171 of variation. And and the.
NOTE Confidence: 0.657052881909091

00:29:08.171 --> 00:29:10.493 Another take home message is the
NOTE Confidence: 0.657052881909091

00:29:10.493 --> 00:29:13.157 hybrid and largely captures the risk
NOTE Confidence: 0.657052881909091

00:29:13.157 --> 00:29:16.273 attributable to Ben 30 burden of OC
NOTE Confidence: 0.657052881909091

00:29:16.273 --> 00:29:18.787 rather than the tendency to desaturate.
NOTE Confidence: 0.657052881909091

00:29:18.790 --> 00:29:21.670 And we favor hypoxic burden over
NOTE Confidence: 0.657052881909091

00:29:21.670 --> 00:29:23.590 ventilated burden because ventilation
NOTE Confidence: 0.657052881909091

00:29:23.661 --> 00:29:26.199 is usually more difficult to measure.
NOTE Confidence: 0.657052881909091

00:29:26.200 --> 00:29:28.860 In a home based setting and their
NOTE Confidence: 0.657052881909091

00:29:28.860 --> 00:29:30.613 calibration issues and lack
NOTE Confidence: 0.657052881909091

00:29:30.613 --> 00:29:31.699 of standardization.
NOTE Confidence: 0.71772098575

00:29:33.980 --> 00:29:36.860 OK. So that was related to hypoxic planets.
NOTE Confidence: 0.71772098575

00:29:36.860 --> 00:29:39.308 Next I moved to Hartford response
NOTE Confidence: 0.71772098575

00:29:39.308 --> 00:29:40.940 to Afghans and Hypopneas.

NOTE Confidence: 0.71772098575

00:29:40.940 --> 00:29:46.310 So this this is slide was actually.

NOTE Confidence: 0.71772098575

00:29:46.310 --> 00:29:51.103 From doctor summers. Paper in 1995.

NOTE Confidence: 0.71772098575

00:29:51.103 --> 00:29:53.569 Where he described sleep apnea and

NOTE Confidence: 0.71772098575

00:29:53.569 --> 00:29:56.422 an increase in sympathetic activity

NOTE Confidence: 0.71772098575

00:29:56.422 --> 00:29:59.367 and and increasing blood pressure.

NOTE Confidence: 0.71772098575

00:29:59.370 --> 00:30:02.562 As you see here with each respiratory events

NOTE Confidence: 0.71772098575

00:30:02.562 --> 00:30:05.585 there are an increase in in heart rate.

NOTE Confidence: 0.71772098575

00:30:05.590 --> 00:30:09.256 So we were thinking so if by

NOTE Confidence: 0.71772098575

00:30:09.256 --> 00:30:11.188 measuring this this delta heart rate,

NOTE Confidence: 0.71772098575

00:30:11.190 --> 00:30:14.417 increasing heart rate with each event we

NOTE Confidence: 0.71772098575

00:30:14.417 --> 00:30:17.612 may gain additional information that and

NOTE Confidence: 0.71772098575

00:30:17.612 --> 00:30:20.699 that may be useful for risk prediction

NOTE Confidence: 0.71772098575

00:30:20.699 --> 00:30:24.522 or for to to identify who respond to

NOTE Confidence: 0.71772098575

00:30:24.522 --> 00:30:27.960 CPAP treatment and who benefit from C.

NOTE Confidence: 0.71772098575

00:30:27.960 --> 00:30:31.054 So some patients have a larger heart

NOTE Confidence: 0.71772098575

00:30:31.054 --> 00:30:34.059 rate response to events than others.
NOTE Confidence: 0.71772098575

00:30:34.060 --> 00:30:37.516 Here I'm showing two different subjects.
NOTE Confidence: 0.71772098575

00:30:37.520 --> 00:30:41.345 And in the bottom figure here you see the
NOTE Confidence: 0.71772098575

00:30:41.345 --> 00:30:44.668 increase in heart rate by this Red Arrows.
NOTE Confidence: 0.71772098575

00:30:44.670 --> 00:30:46.770 So this subject has a minimal increase
NOTE Confidence: 0.71772098575

00:30:46.770 --> 00:30:49.287 in heart rate with each respective event,
NOTE Confidence: 0.71772098575

00:30:49.290 --> 00:30:54.160 despite similar oxygen desaturation amounts.
NOTE Confidence: 0.71772098575

00:30:54.160 --> 00:30:56.782 And while this subject has a
NOTE Confidence: 0.71772098575

00:30:56.782 --> 00:30:59.589 larger increase in in heart rate.
NOTE Confidence: 0.71772098575

00:30:59.590 --> 00:31:02.229 So Delta Hartrick can be easily measured
NOTE Confidence: 0.71772098575

00:31:02.229 --> 00:31:05.262 from in in lab and in home PSG's and
NOTE Confidence: 0.71772098575

00:31:05.262 --> 00:31:07.203 currently is really under utilized.
NOTE Confidence: 0.71772098575

00:31:07.203 --> 00:31:10.794 So and we our previous study back
NOTE Confidence: 0.71772098575

00:31:10.794 --> 00:31:14.598 in 2013 we showed that delta heart
NOTE Confidence: 0.71772098575

00:31:14.598 --> 00:31:17.760 rate increases with event severity.
NOTE Confidence: 0.71772098575

00:31:17.760 --> 00:31:20.015 And and in observations without

NOTE Confidence: 0.71772098575

00:31:20.015 --> 00:31:22.270 cortical arousal and with arousal.

NOTE Confidence: 0.71772098575

00:31:22.270 --> 00:31:24.950 So there was a similar pattern of increase.

NOTE Confidence: 0.71772098575

00:31:24.950 --> 00:31:26.510 Obviously if you have a razor,

NOTE Confidence: 0.71772098575

00:31:26.510 --> 00:31:28.802 you have the biggest,

NOTE Confidence: 0.71772098575

00:31:28.802 --> 00:31:31.094 the the largest increase.

NOTE Confidence: 0.71772098575

00:31:31.100 --> 00:31:35.412 So the hypothesis was that high delta

NOTE Confidence: 0.71772098575

00:31:35.412 --> 00:31:37.668 heart rates is associated with increased

NOTE Confidence: 0.71772098575

00:31:37.668 --> 00:31:39.959 risk of cardiovascular disease.

NOTE Confidence: 0.71772098575

00:31:39.960 --> 00:31:43.595 And we separately hypothesize that

NOTE Confidence: 0.71772098575

00:31:43.595 --> 00:31:45.776 removing respiratory stimuli.

NOTE Confidence: 0.71772098575

00:31:45.780 --> 00:31:49.049 And and those are apneas and hypopneas

NOTE Confidence: 0.71772098575

00:31:49.049 --> 00:31:49.983 by CPAP.

NOTE Confidence: 0.71772098575

00:31:49.990 --> 00:31:52.444 Could be beneficial in in those

NOTE Confidence: 0.71772098575

00:31:52.444 --> 00:31:54.630 with High Delta heart rates.

NOTE Confidence: 0.71772098575

00:31:54.630 --> 00:31:56.628 So to test the first hypothesis,

NOTE Confidence: 0.71772098575

00:31:56.630 --> 00:31:59.792 we looked at the Mesa and
NOTE Confidence: 0.71772098575

00:31:59.792 --> 00:32:01.373 Steve Hartman study.
NOTE Confidence: 0.71772098575

00:32:01.380 --> 00:32:04.074 And and this here I'm showing
NOTE Confidence: 0.71772098575

00:32:04.074 --> 00:32:05.870 this sample flow chart.
NOTE Confidence: 0.71772098575

00:32:05.870 --> 00:32:10.035 At the end about 14 hundreds were
NOTE Confidence: 0.71772098575

00:32:10.035 --> 00:32:13.163 analyzing Masa and about 4600
NOTE Confidence: 0.71772098575

00:32:13.163 --> 00:32:16.428 analyzing from Cpot health study.
NOTE Confidence: 0.71772098575

00:32:16.430 --> 00:32:18.974 So we saw a U-shaped association
NOTE Confidence: 0.71772098575

00:32:18.974 --> 00:32:22.362 between Dalton Hartry and subclinical
NOTE Confidence: 0.71772098575

00:32:22.362 --> 00:32:25.530 CVD measures including.
NOTE Confidence: 0.71772098575

00:32:25.530 --> 00:32:27.315 Calcium score NT,
NOTE Confidence: 0.71772098575

00:32:27.315 --> 00:32:30.885 probie NP and Framingham CVD risk.
NOTE Confidence: 0.71772098575

00:32:30.890 --> 00:32:32.282 And based on this,
NOTE Confidence: 0.71772098575

00:32:32.282 --> 00:32:34.890 we categorize the doctor heart rate in low,
NOTE Confidence: 0.71772098575

00:32:34.890 --> 00:32:36.478 mid and high groups.
NOTE Confidence: 0.71772098575

00:32:36.478 --> 00:32:40.200 And we looked at, we tested that.

NOTE Confidence: 0.71772098575

00:32:40.200 --> 00:32:42.620 Categories and and sleep harthouse.

NOTE Confidence: 0.71772098575

00:32:42.620 --> 00:32:45.062 And what we saw was that indeed

NOTE Confidence: 0.71772098575

00:32:45.062 --> 00:32:47.876 those with low and High Delta Party,

NOTE Confidence: 0.71772098575

00:32:47.880 --> 00:32:51.102 they were at increased risk of

NOTE Confidence: 0.71772098575

00:32:51.102 --> 00:32:53.575 CVD and nonfatal CVD,

NOTE Confidence: 0.71772098575

00:32:53.575 --> 00:32:57.445 CVD mortality and all 'cause mortality.

NOTE Confidence: 0.71772098575

00:32:57.450 --> 00:33:01.179 So, so basically.

NOTE Confidence: 0.71772098575

00:33:01.180 --> 00:33:03.364 The risk observing the low delta

NOTE Confidence: 0.71772098575

00:33:03.364 --> 00:33:06.430 heart rate group we we thought and we

NOTE Confidence: 0.71772098575

00:33:06.430 --> 00:33:08.740 hypothesized that was actually non OC

NOTE Confidence: 0.71772098575

00:33:08.810 --> 00:33:11.680 specific and mainly due to heart disease,

NOTE Confidence: 0.71772098575

00:33:11.680 --> 00:33:14.266 diabetes or autonomic dysfunction and and

NOTE Confidence: 0.71772098575

00:33:14.266 --> 00:33:17.470 the risk observing the height of the group.

NOTE Confidence: 0.71772098575

00:33:17.470 --> 00:33:20.650 Was mostly OSA specific because we

NOTE Confidence: 0.71772098575

00:33:20.650 --> 00:33:24.164 saw hired hazard ratio in those with

NOTE Confidence: 0.71772098575

00:33:24.164 --> 00:33:27.328 severe OSA whether quantified by HIV

NOTE Confidence: 0.71772098575

00:33:27.328 --> 00:33:30.764 or hypoxic German and the risk was

NOTE Confidence: 0.71772098575

00:33:30.764 --> 00:33:32.944 exclusively observing those with ESS

NOTE Confidence: 0.71772098575

00:33:32.944 --> 00:33:36.480 less than 11, so non sleepy OSA.

NOTE Confidence: 0.71772098575

00:33:36.480 --> 00:33:39.505 So the next question was.

NOTE Confidence: 0.7200788775

00:33:39.510 --> 00:33:41.946 If with CPAP, reduce the risk in

NOTE Confidence: 0.7200788775

00:33:41.946 --> 00:33:44.300 those with high throughput rates.

NOTE Confidence: 0.7200788775

00:33:44.300 --> 00:33:47.359 And and to answer this questions we

NOTE Confidence: 0.7200788775

00:33:47.360 --> 00:33:50.930 we looked at the recuts of trial.

NOTE Confidence: 0.7200788775

00:33:50.930 --> 00:33:53.394 So request the trial was done and

NOTE Confidence: 0.7200788775

00:33:53.394 --> 00:33:55.828 it was published actually in 2016,

NOTE Confidence: 0.7200788775

00:33:55.828 --> 00:33:58.468 non sleepy patients with OSA

NOTE Confidence: 0.7200788775

00:33:58.468 --> 00:34:00.580 and coronary artery disease

NOTE Confidence: 0.7200788775

00:34:00.672 --> 00:34:05.310 randomized to CPAP or no CPAP. And.

NOTE Confidence: 0.7200788775

00:34:05.310 --> 00:34:07.962 The HI criteria for inclusion was

NOTE Confidence: 0.7200788775

00:34:07.962 --> 00:34:11.230 greater than 15 ESS, less than 10,

NOTE Confidence: 0.7200788775

00:34:11.230 --> 00:34:13.230 median follow-up was about

NOTE Confidence: 0.7200788775

00:34:13.230 --> 00:34:16.760 57 months and the outcome?

NOTE Confidence: 0.7200788775

00:34:16.760 --> 00:34:19.676 Was a composite of first event

NOTE Confidence: 0.7200788775

00:34:19.676 --> 00:34:21.134 of repeat vascularization,

NOTE Confidence: 0.7200788775

00:34:21.140 --> 00:34:24.770 my MI stroke or cardiovascular mortality.

NOTE Confidence: 0.7200788775

00:34:24.770 --> 00:34:28.098 And we asked the question is the CPAP

NOTE Confidence: 0.7200788775

00:34:28.098 --> 00:34:30.430 benefit contingent on the heart rate

NOTE Confidence: 0.7200788775

00:34:30.430 --> 00:34:33.456 response to events and what we saw is

NOTE Confidence: 0.7200788775

00:34:33.456 --> 00:34:36.284 these graph here show the point estimates.

NOTE Confidence: 0.7200788775

00:34:36.290 --> 00:34:40.138 At average delta heart rate 6 beats per

NOTE Confidence: 0.7200788775

00:34:40.138 --> 00:34:43.886 minute and this is what's recuts trial.

NOTE Confidence: 0.7200788775

00:34:43.890 --> 00:34:46.330 The original recursive trial showed

NOTE Confidence: 0.7200788775

00:34:46.330 --> 00:34:48.900 was about 0.8 non significant

NOTE Confidence: 0.7200788775

00:34:48.900 --> 00:34:51.470 and low delta heart rate.

NOTE Confidence: 0.7200788775

00:34:51.470 --> 00:34:54.459 There was a suggestion of harm and

NOTE Confidence: 0.7200788775

00:34:54.459 --> 00:34:56.673 so treating people with no low
NOTE Confidence: 0.7200788775

00:34:56.673 --> 00:34:59.121 Delta Harvard seem to I was non
NOTE Confidence: 0.7200788775

00:34:59.121 --> 00:35:00.983 significant and very wide confidence
NOTE Confidence: 0.7200788775

00:35:00.983 --> 00:35:03.101 interval and but within those with
NOTE Confidence: 0.7200788775

00:35:03.101 --> 00:35:04.889 high tops of heart rate,
NOTE Confidence: 0.7200788775

00:35:04.890 --> 00:35:07.110 higher delta heart rate.
NOTE Confidence: 0.7200788775

00:35:07.110 --> 00:35:10.253 We saw a risk reduction at
NOTE Confidence: 0.7200788775

00:35:10.253 --> 00:35:11.726 significant risk reduction.
NOTE Confidence: 0.884469788

00:35:14.160 --> 00:35:17.410 Compared to other group so.
NOTE Confidence: 0.884469788

00:35:17.410 --> 00:35:20.308 And and the model were just for age 6,
NOTE Confidence: 0.884469788

00:35:20.310 --> 00:35:22.178 PMI and cardiac intervention.
NOTE Confidence: 0.904744382857143

00:35:24.790 --> 00:35:27.184 This is basically showing the same thing,
NOTE Confidence: 0.904744382857143

00:35:27.190 --> 00:35:29.890 but we have binary subgroup analysis.
NOTE Confidence: 0.904744382857143

00:35:29.890 --> 00:35:34.769 We have all participants gained similar to.
NOTE Confidence: 0.904744382857143

00:35:34.770 --> 00:35:38.186 That's a trial, so it was no effect.
NOTE Confidence: 0.904744382857143

00:35:38.190 --> 00:35:40.850 If you look at Delta heart rate

NOTE Confidence: 0.904744382857143

00:35:40.850 --> 00:35:43.270 threatens it's it's per minute you

NOTE Confidence: 0.904744382857143

00:35:43.270 --> 00:35:45.570 see that the CPAP significantly

NOTE Confidence: 0.904744382857143

00:35:45.570 --> 00:35:48.089 reduces the risk compared to this.

NOTE Confidence: 0.72351350625

00:35:50.980 --> 00:35:53.452 So in summary, a greater Harter

NOTE Confidence: 0.72351350625

00:35:53.452 --> 00:35:55.586 response to respiratory events is

NOTE Confidence: 0.72351350625

00:35:55.586 --> 00:35:57.636 a risk factor that's identifiable,

NOTE Confidence: 0.72351350625

00:35:57.640 --> 00:35:59.556 deleterious, and potentially reversible.

NOTE Confidence: 0.72351350625

00:35:59.556 --> 00:36:03.575 And it could be used to select patients

NOTE Confidence: 0.72351350625

00:36:03.575 --> 00:36:06.767 most likely to exhibit long term

NOTE Confidence: 0.72351350625

00:36:06.767 --> 00:36:09.478 cardiovascular benefit from CPAP treatments.

NOTE Confidence: 0.72351350625

00:36:09.480 --> 00:36:12.670 I think I have time.

NOTE Confidence: 0.72351350625

00:36:12.670 --> 00:36:15.298 Do I have maybe 6-7 minutes

NOTE Confidence: 0.72351350625

00:36:15.298 --> 00:36:17.440 to talk about this or?

NOTE Confidence: 0.6518407

00:36:19.610 --> 00:36:23.010 Yep. OK. Yeah, that sounds good.

NOTE Confidence: 0.6518407

00:36:23.010 --> 00:36:27.384 Thank you. So in and so this this work

NOTE Confidence: 0.6518407

00:36:27.384 --> 00:36:30.696 is currently under review and we're here

NOTE Confidence: 0.6518407

00:36:30.696 --> 00:36:34.219 we we're interested in the relevance of

NOTE Confidence: 0.6518407

00:36:34.219 --> 00:36:36.819 EEG arousal for risk stratification.

NOTE Confidence: 0.6518407

00:36:36.820 --> 00:36:38.410 So really the question was,

NOTE Confidence: 0.6518407

00:36:38.410 --> 00:36:41.560 do arousal improve prediction of OC

NOTE Confidence: 0.6518407

00:36:41.560 --> 00:36:44.372 related outcomes on top of desaturation?

NOTE Confidence: 0.6518407

00:36:44.372 --> 00:36:47.454 So over the past four decades, several

NOTE Confidence: 0.6518407

00:36:47.454 --> 00:36:49.998 versions of OC definition have emerged,

NOTE Confidence: 0.6518407

00:36:50.000 --> 00:36:53.156 which led to confusion among patient,

NOTE Confidence: 0.6518407

00:36:53.160 --> 00:36:54.198 clinician and payers.

NOTE Confidence: 0.6518407

00:36:54.198 --> 00:36:56.274 And and you were interested which

NOTE Confidence: 0.6518407

00:36:56.274 --> 00:36:58.771 type of hypo you know went to the

NOTE Confidence: 0.6518407

00:36:58.771 --> 00:37:00.448 desaturation of arousal would inform

NOTE Confidence: 0.6518407

00:37:00.448 --> 00:37:02.233 research stratification and the reason

NOTE Confidence: 0.6518407

00:37:02.233 --> 00:37:05.080 to do this study that was this ASM

NOTE Confidence: 0.6518407

00:37:05.080 --> 00:37:06.850 funded study that to systematically

NOTE Confidence: 0.6518407
00:37:06.917 --> 00:37:08.896 compare events with arousal and
NOTE Confidence: 0.6518407
00:37:08.896 --> 00:37:10.676 the saturation in multiple cohorts.
NOTE Confidence: 0.6518407
00:37:10.680 --> 00:37:13.170 So we used sleep quite health
NOTE Confidence: 0.6518407
00:37:13.170 --> 00:37:15.869 Mesa and slots for this study.
NOTE Confidence: 0.6518407
00:37:15.869 --> 00:37:18.482 So we compared events with
NOTE Confidence: 0.6518407
00:37:18.482 --> 00:37:20.806 minimal desaturation and arousal.
NOTE Confidence: 0.6518407
00:37:20.810 --> 00:37:24.818 So that's called HIV arousal only.
NOTE Confidence: 0.6518407
00:37:24.820 --> 00:37:26.720 And events with the saturation
NOTE Confidence: 0.6518407
00:37:26.720 --> 00:37:27.860 and no arousal.
NOTE Confidence: 0.6518407
00:37:27.860 --> 00:37:31.540 That's called H greater than 3% only.
NOTE Confidence: 0.6518407
00:37:31.540 --> 00:37:34.530 So these are the two.
NOTE Confidence: 0.6518407
00:37:34.530 --> 00:37:38.290 To specific HIV that we were interested in.
NOTE Confidence: 0.6518407
00:37:38.290 --> 00:37:41.578 So just quickly showed that sample
NOTE Confidence: 0.6518407
00:37:41.578 --> 00:37:43.770 characteristics of sleep heart
NOTE Confidence: 0.6518407
00:37:43.854 --> 00:37:46.530 health have shown that in the
NOTE Confidence: 0.6518407

00:37:46.530 --> 00:37:49.250 previous slide Mesa and Mr Oz and.
NOTE Confidence: 0.6518407

00:37:49.250 --> 00:37:52.274 The outcomes that we were interested in
NOTE Confidence: 0.6518407

00:37:52.274 --> 00:37:54.570 was so there were some cross-sectional
NOTE Confidence: 0.6518407

00:37:54.570 --> 00:37:55.686 outcomes including hypertension,
NOTE Confidence: 0.6518407

00:37:55.690 --> 00:37:58.380 diabetes and sleepiness and some
NOTE Confidence: 0.6518407

00:37:58.380 --> 00:38:01.070 follow up data longitudinal data
NOTE Confidence: 0.6518407

00:38:01.159 --> 00:38:04.210 instance CD in in these three cohorts.
NOTE Confidence: 0.6518407

00:38:04.210 --> 00:38:08.374 So again so this table shows
NOTE Confidence: 0.6518407

00:38:08.374 --> 00:38:10.929 the total number of events.
NOTE Confidence: 0.6518407

00:38:10.930 --> 00:38:14.000 Analyzed in these three cohorts.
NOTE Confidence: 0.8272740411111111

00:38:16.510 --> 00:38:19.807 And the distribution of events with more
NOTE Confidence: 0.8272740411111111

00:38:19.807 --> 00:38:25.230 than 3% desaturation only about 54%.
NOTE Confidence: 0.8272740411111111

00:38:25.230 --> 00:38:28.911 43% in Mesa and in Mr Ross for the 43%.
NOTE Confidence: 0.8272740411111111

00:38:28.911 --> 00:38:32.698 And but 13% of events would with
NOTE Confidence: 0.8272740411111111

00:38:32.698 --> 00:38:36.597 arousal only and no desaturation here,
NOTE Confidence: 0.8272740411111111

00:38:36.600 --> 00:38:38.248 but you see here.

NOTE Confidence: 0.8272740411111111
00:38:38.248 --> 00:38:41.380 These are the headlines of those events.
NOTE Confidence: 0.8272740411111111
00:38:41.380 --> 00:38:44.467 And the so this translate to this
NOTE Confidence: 0.8272740411111111
00:38:44.467 --> 00:38:47.058 HIV values that you see here.
NOTE Confidence: 0.8272740411111111
00:38:47.060 --> 00:38:50.448 So if you if you include these
NOTE Confidence: 0.8272740411111111
00:38:50.448 --> 00:38:53.290 events events with arousal only.
NOTE Confidence: 0.5822212525
00:38:56.090 --> 00:38:58.005 So prevalence of Margaret Zero
NOTE Confidence: 0.5822212525
00:38:58.005 --> 00:39:00.672 say would be 67 percent, 70%,
NOTE Confidence: 0.5822212525
00:39:00.672 --> 00:39:03.728 sixty 8% in this state cohorts.
NOTE Confidence: 0.5822212525
00:39:03.730 --> 00:39:06.250 But if you exclude these events,
NOTE Confidence: 0.5822212525
00:39:06.250 --> 00:39:09.994 you get a 10% reduction from
NOTE Confidence: 0.5822212525
00:39:09.994 --> 00:39:11.610 supposedly across street cops.
NOTE Confidence: 0.85770133952381
00:39:13.760 --> 00:39:16.320 So it's important to really look at these
NOTE Confidence: 0.85770133952381
00:39:16.320 --> 00:39:19.228 and see if there is any any additional
NOTE Confidence: 0.85770133952381
00:39:19.228 --> 00:39:21.350 information that these is provided.
NOTE Confidence: 0.85770133952381
00:39:21.350 --> 00:39:26.398 So what what you see here is the.
NOTE Confidence: 0.85770133952381

00:39:26.400 --> 00:39:28.368 Additional role of events with this
NOTE Confidence: 0.85770133952381

00:39:28.368 --> 00:39:30.640 saturation, but no other else.
NOTE Confidence: 0.85770133952381

00:39:30.640 --> 00:39:33.594 And the model were adjusted for covariates
NOTE Confidence: 0.85770133952381

00:39:33.594 --> 00:39:36.668 and HIV based on events with arousal.
NOTE Confidence: 0.85770133952381

00:39:36.670 --> 00:39:38.602 So regardless of desaturation.
NOTE Confidence: 0.85770133952381

00:39:38.602 --> 00:39:42.784 As you see here, across all all the
NOTE Confidence: 0.85770133952381

00:39:42.784 --> 00:39:45.589 outcomes you see as significant.
NOTE Confidence: 0.85770133952381

00:39:45.590 --> 00:39:48.400 Increase in in in risk.
NOTE Confidence: 0.85770133952381

00:39:48.400 --> 00:39:52.837 But if you look at the HIV arousal only.
NOTE Confidence: 0.85770133952381

00:39:52.840 --> 00:39:54.895 There's basically nothing
NOTE Confidence: 0.85770133952381

00:39:54.895 --> 00:39:57.635 so additional those events.
NOTE Confidence: 0.85770133952381

00:39:57.640 --> 00:40:00.040 If you adjust for desaturation events
NOTE Confidence: 0.85770133952381

00:40:00.040 --> 00:40:02.739 with these saturation of the also Brazil.
NOTE Confidence: 0.85770133952381

00:40:02.740 --> 00:40:06.924 So this what what this is is basically.
NOTE Confidence: 0.85770133952381

00:40:06.930 --> 00:40:09.546 Assume that you send the subject
NOTE Confidence: 0.85770133952381

00:40:09.546 --> 00:40:13.020 and you send an HD to the subject.

NOTE Confidence: 0.85770133952381
00:40:13.020 --> 00:40:15.872 And you get all the 3% events
NOTE Confidence: 0.85770133952381
00:40:15.872 --> 00:40:17.360 with more than 3%,
NOTE Confidence: 0.85770133952381
00:40:17.360 --> 00:40:20.020 so you don't measure arousals.
NOTE Confidence: 0.85770133952381
00:40:20.020 --> 00:40:23.161 And then you bring them back to the sleep
NOTE Confidence: 0.85770133952381
00:40:23.161 --> 00:40:26.469 lab and you find those additional events.
NOTE Confidence: 0.85770133952381
00:40:26.470 --> 00:40:29.470 That were associated with arousals.
NOTE Confidence: 0.85770133952381
00:40:29.470 --> 00:40:32.081 And what what we see here that
NOTE Confidence: 0.85770133952381
00:40:32.081 --> 00:40:34.390 those really don't add any info,
NOTE Confidence: 0.85770133952381
00:40:34.390 --> 00:40:37.870 don't improve the prediction of outcomes.
NOTE Confidence: 0.85770133952381
00:40:37.870 --> 00:40:39.150 As you see here,
NOTE Confidence: 0.85770133952381
00:40:39.150 --> 00:40:42.860 and in some cases they're even protected.
NOTE Confidence: 0.85770133952381
00:40:42.860 --> 00:40:45.653 So this I think we didn't adjust
NOTE Confidence: 0.85770133952381
00:40:45.653 --> 00:40:48.100 this for BMI so this this.
NOTE Confidence: 0.85770133952381
00:40:48.100 --> 00:40:52.676 This table which is BMI again you see
NOTE Confidence: 0.85770133952381
00:40:52.676 --> 00:40:55.212 similar direction and and slightly.
NOTE Confidence: 0.85770133952381

00:40:55.212 --> 00:40:59.076 A lower heat hazard or odds ratio,
NOTE Confidence: 0.85770133952381

00:40:59.080 --> 00:41:01.776 but it's similar story that we had before.
NOTE Confidence: 0.860733749

00:41:04.650 --> 00:41:07.828 So what we did this was an
NOTE Confidence: 0.860733749

00:41:07.828 --> 00:41:09.190 additional exploratory analysis.
NOTE Confidence: 0.860733749

00:41:09.190 --> 00:41:12.202 We looked at individuals now with
NOTE Confidence: 0.860733749

00:41:12.202 --> 00:41:14.870 an HI getting 15 events per hour.
NOTE Confidence: 0.852290072

00:41:17.540 --> 00:41:22.223 Again, based on H 3% regards of arousal.
NOTE Confidence: 0.852290072

00:41:22.223 --> 00:41:25.028 So exclude everyone who had
NOTE Confidence: 0.852290072

00:41:25.028 --> 00:41:27.799 severe OSA by desaturation.
NOTE Confidence: 0.852290072

00:41:27.800 --> 00:41:30.271 Audit to Studio City and again in
NOTE Confidence: 0.852290072

00:41:30.271 --> 00:41:32.963 this in these individual events with
NOTE Confidence: 0.852290072

00:41:32.963 --> 00:41:35.548 arousal put but no desaturation.
NOTE Confidence: 0.852290072

00:41:35.550 --> 00:41:37.718 Were not associated to it with this stuff,
NOTE Confidence: 0.852290072

00:41:37.720 --> 00:41:39.892 adverse outcomes. So similar,
NOTE Confidence: 0.852290072

00:41:39.892 --> 00:41:43.150 similar similar results that we've found.
NOTE Confidence: 0.867928625

00:41:45.280 --> 00:41:47.956 And and to further investigate this,

NOTE Confidence: 0.867928625
00:41:47.960 --> 00:41:50.270 we looked at the arousal
NOTE Confidence: 0.867928625
00:41:50.270 --> 00:41:52.118 intensity and arousal index.
NOTE Confidence: 0.867928625
00:41:52.120 --> 00:41:54.760 I think this was just be part of the study.
NOTE Confidence: 0.867928625
00:41:54.760 --> 00:41:56.400 You see, that's the arousal.
NOTE Confidence: 0.867928625
00:41:56.400 --> 00:41:59.256 Intensity tends to go down as well if
NOTE Confidence: 0.867928625
00:41:59.256 --> 00:42:02.600 you get more arousals per hour of sleep.
NOTE Confidence: 0.867928625
00:42:02.600 --> 00:42:05.421 So there is a negative association here
NOTE Confidence: 0.867928625
00:42:05.421 --> 00:42:09.200 and we did another analysis, we looked at.
NOTE Confidence: 0.867928625
00:42:09.200 --> 00:42:12.080 Change in arousal index and the
NOTE Confidence: 0.867928625
00:42:12.176 --> 00:42:16.194 sleep heart health and what we saw
NOTE Confidence: 0.867928625
00:42:16.194 --> 00:42:19.860 was that changing arousal index was.
NOTE Confidence: 0.867928625
00:42:19.860 --> 00:42:22.998 Predicted by baseline, Oasis, Verity what?
NOTE Confidence: 0.867928625
00:42:23.000 --> 00:42:25.600 What it tells us is that over time there
NOTE Confidence: 0.867928625
00:42:25.600 --> 00:42:27.970 is a decline in a number of arousal.
NOTE Confidence: 0.87628761
00:42:30.410 --> 00:42:34.750 And separately in another study
NOTE Confidence: 0.87628761

00:42:34.750 --> 00:42:38.590 that my poster Gonzalo Labarca did.
NOTE Confidence: 0.87628761

00:42:38.590 --> 00:42:41.728 We looked at a razor burn.
NOTE Confidence: 0.87628761

00:42:41.730 --> 00:42:43.023 Which we defined.
NOTE Confidence: 0.87628761

00:42:43.023 --> 00:42:45.178 It is similar to the.
NOTE Confidence: 0.87628761

00:42:45.180 --> 00:42:47.510 Paper published by the Australian
NOTE Confidence: 0.87628761

00:42:47.510 --> 00:42:50.357 group event rate times arousal duration
NOTE Confidence: 0.87628761

00:42:50.357 --> 00:42:53.416 and we compared it with hypoxic burden.
NOTE Confidence: 0.87628761

00:42:53.420 --> 00:42:56.078 So again. Compared to hypoxic burden,
NOTE Confidence: 0.87628761

00:42:56.080 --> 00:42:57.908 there is no significant
NOTE Confidence: 0.87628761

00:42:57.908 --> 00:42:59.736 sociation with arousal burden.
NOTE Confidence: 0.790708206363636

00:43:03.170 --> 00:43:05.228 So to take your message is
NOTE Confidence: 0.790708206363636

00:43:05.228 --> 00:43:07.260 while arousal may be harmful.
NOTE Confidence: 0.790708206363636

00:43:07.260 --> 00:43:09.156 Based on experimental data,
NOTE Confidence: 0.790708206363636

00:43:09.156 --> 00:43:11.270 measurements of arousal may not
NOTE Confidence: 0.790708206363636

00:43:11.270 --> 00:43:12.650 improve its positions department.
NOTE Confidence: 0.801922593636364

00:43:14.700 --> 00:43:16.974 So in summary, measuring the depth

NOTE Confidence: 0.801922593636364

00:43:16.974 --> 00:43:19.320 and duration of this saturation.

NOTE Confidence: 0.801922593636364

00:43:19.320 --> 00:43:22.968 That should provide added predictive value.

NOTE Confidence: 0.801922593636364

00:43:22.970 --> 00:43:26.114 So we can measure hypoxic from there than

NOTE Confidence: 0.801922593636364

00:43:26.114 --> 00:43:28.940 from inlab and in home sleep studies.

NOTE Confidence: 0.801922593636364

00:43:28.940 --> 00:43:32.035 We demonstrated that hypothesis paramedics

NOTE Confidence: 0.801922593636364

00:43:32.035 --> 00:43:35.130 multiple outcomes in population base

NOTE Confidence: 0.801922593636364

00:43:35.211 --> 00:43:38.750 and and French group in Congo cohorts.

NOTE Confidence: 0.801922593636364

00:43:38.750 --> 00:43:41.676 We show that hypoxic burden is strongly

NOTE Confidence: 0.801922593636364

00:43:41.676 --> 00:43:43.470 associated with entity burden.

NOTE Confidence: 0.801922593636364

00:43:43.470 --> 00:43:45.694 And is minimally affected

NOTE Confidence: 0.801922593636364

00:43:45.694 --> 00:43:47.918 by the abdominal obesity.

NOTE Confidence: 0.801922593636364

00:43:47.920 --> 00:43:52.365 And we also showed that individual without

NOTE Confidence: 0.801922593636364

00:43:52.365 --> 00:43:56.500 sleepiness the elevated heart responsiveness.

NOTE Confidence: 0.801922593636364

00:43:56.500 --> 00:43:58.636 Those will be at increased risk

NOTE Confidence: 0.801922593636364

00:43:58.636 --> 00:44:01.529 of CVD and may benefit from CPAP.

NOTE Confidence: 0.801922593636364

00:44:01.530 --> 00:44:03.282 And additional advanced with
NOTE Confidence: 0.801922593636364

00:44:03.282 --> 00:44:05.910 arousal and all the saturation to
NOTE Confidence: 0.801922593636364

00:44:05.982 --> 00:44:07.958 not improve this prediction.
NOTE Confidence: 0.801922593636364

00:44:07.960 --> 00:44:08.676 And finally,
NOTE Confidence: 0.801922593636364

00:44:08.676 --> 00:44:11.522 I'd like to thank you the amazing
NOTE Confidence: 0.801922593636364

00:44:11.522 --> 00:44:14.678 team in Boston and elsewhere for.
NOTE Confidence: 0.801922593636364

00:44:14.680 --> 00:44:18.804 Great contributions to to help with the,
NOTE Confidence: 0.801922593636364

00:44:18.804 --> 00:44:19.588 the data,
NOTE Confidence: 0.801922593636364

00:44:19.588 --> 00:44:23.230 with the analysis and and and and everything.
NOTE Confidence: 0.801922593636364

00:44:23.230 --> 00:44:25.990 And thanks everyone for.
NOTE Confidence: 0.801922593636364

00:44:25.990 --> 00:44:26.718 Listening to my talk.
NOTE Confidence: 0.885887704285714

00:44:28.420 --> 00:44:31.416 Thank you so much. That was fantastic,
NOTE Confidence: 0.885887704285714

00:44:31.420 --> 00:44:33.730 very informative and really enjoyed
NOTE Confidence: 0.885887704285714

00:44:33.730 --> 00:44:36.040 hearing that the different algorithms
NOTE Confidence: 0.885887704285714

00:44:36.112 --> 00:44:38.137 you've helped develop or developed
NOTE Confidence: 0.885887704285714

00:44:38.137 --> 00:44:40.162 yourself and how they've been

NOTE Confidence: 0.885887704285714

00:44:40.234 --> 00:44:42.579 applied to different clinical trials.

NOTE Confidence: 0.885887704285714

00:44:42.580 --> 00:44:44.440 I'm going to take questions now,

NOTE Confidence: 0.885887704285714

00:44:44.440 --> 00:44:47.331 but I'll ask if you could please

NOTE Confidence: 0.885887704285714

00:44:47.331 --> 00:44:49.872 put your question in the chat and

NOTE Confidence: 0.885887704285714

00:44:49.872 --> 00:44:52.360 let me call on you rather than

NOTE Confidence: 0.885887704285714

00:44:52.360 --> 00:44:55.189 unmuting and and so we can avoid

NOTE Confidence: 0.885887704285714

00:44:55.189 --> 00:44:57.787 the risk of missing questions or

NOTE Confidence: 0.885887704285714

00:44:57.787 --> 00:45:00.640 not giving everyone a chance. Umm.

NOTE Confidence: 0.885887704285714

00:45:00.640 --> 00:45:03.220 So does anyone have any questions?

NOTE Confidence: 0.843142111875

00:45:07.960 --> 00:45:10.126 Doctor Thomas is asking is loop

NOTE Confidence: 0.843142111875

00:45:10.126 --> 00:45:12.003 gain elevated in those with

NOTE Confidence: 0.843142111875

00:45:12.003 --> 00:45:13.788 a high heart rate response?

NOTE Confidence: 0.783852686875

00:45:15.510 --> 00:45:18.443 We looked at this, I think the

NOTE Confidence: 0.783852686875

00:45:18.443 --> 00:45:20.530 correlation between delta heart rate

NOTE Confidence: 0.783852686875

00:45:20.530 --> 00:45:23.600 and Lucan was about 0.2 positive.

NOTE Confidence: 0.545540532

00:45:26.530 --> 00:45:28.830 Yeah. So it's just like, right, ability.
NOTE Confidence: 0.773540749047619

00:45:30.780 --> 00:45:33.125 And then Doctor Winkelman says it looked
NOTE Confidence: 0.773540749047619

00:45:33.125 --> 00:45:36.690 as if low hypoxic burden and high age chi
NOTE Confidence: 0.773540749047619

00:45:36.690 --> 00:45:38.960 were protective from mortality comment.
NOTE Confidence: 0.48102395

00:45:40.910 --> 00:45:42.770 I participated and high.
NOTE Confidence: 0.788895294

00:45:43.530 --> 00:45:45.245 Low hypoxic burden, high I
NOTE Confidence: 0.788895294

00:45:45.245 --> 00:45:46.960 had lower risk of mortality,
NOTE Confidence: 0.7931666

00:45:46.970 --> 00:45:48.622 yes, it was actually, it was insulin
NOTE Confidence: 0.7931666

00:45:48.622 --> 00:45:51.120 heart failure that we found, yes. Yeah.
NOTE Confidence: 0.720258448235294

00:45:53.000 --> 00:45:54.806 So lower risk of incident and
NOTE Confidence: 0.720258448235294

00:45:54.806 --> 00:45:56.346 heart failure with those with
NOTE Confidence: 0.720258448235294

00:45:56.346 --> 00:45:58.014 a high and low hypoxic burden.
NOTE Confidence: 0.570596264

00:45:58.030 --> 00:46:00.134 Yeah, it wasn't significant.
NOTE Confidence: 0.570596264

00:46:00.134 --> 00:46:04.175 So yeah. The hazard ratio I think
NOTE Confidence: 0.570596264

00:46:04.175 --> 00:46:05.480 was 0.9 or something like that.
NOTE Confidence: 0.844792583333334

00:46:07.690 --> 00:46:09.688 And clinically that makes sense because

NOTE Confidence: 0.844792583333334

00:46:09.688 --> 00:46:11.769 with heart failure patients in particular,

NOTE Confidence: 0.844792583333334

00:46:11.770 --> 00:46:15.386 they can often have very long apneas and

NOTE Confidence: 0.844792583333334

00:46:15.386 --> 00:46:18.184 in combination with the circulatory delay

NOTE Confidence: 0.844792583333334

00:46:18.184 --> 00:46:20.715 it can be much more detrimental than

NOTE Confidence: 0.844792583333334

00:46:20.715 --> 00:46:22.850 than a patient without heart failure.

NOTE Confidence: 0.844792583333334

00:46:22.850 --> 00:46:24.418 Doctor Thomas says patients

NOTE Confidence: 0.844792583333334

00:46:24.418 --> 00:46:25.986 come with now symptoms,

NOTE Confidence: 0.844792583333334

00:46:25.990 --> 00:46:27.850 not for future prevention mostly,

NOTE Confidence: 0.844792583333334

00:46:27.850 --> 00:46:29.788 so arousals should not be ignored.

NOTE Confidence: 0.902953904285714

00:46:33.080 --> 00:46:36.699 Yes, this has been a very controversial.

NOTE Confidence: 0.902953904285714

00:46:36.700 --> 00:46:39.178 Study that we, I mean we didn't

NOTE Confidence: 0.902953904285714

00:46:39.178 --> 00:46:41.628 expect that to see this results.

NOTE Confidence: 0.902953904285714

00:46:41.630 --> 00:46:44.382 But and and I mean it may be

NOTE Confidence: 0.902953904285714

00:46:44.382 --> 00:46:47.509 in in younger individuals if.

NOTE Confidence: 0.84977918

00:46:49.720 --> 00:46:52.440 The beginning of the disease.

NOTE Confidence: 0.84977918

00:46:52.440 --> 00:46:55.093 They may be very informative, but.
NOTE Confidence: 0.84977918

00:46:55.093 --> 00:46:57.571 These, these are mostly older individual
NOTE Confidence: 0.84977918

00:46:57.571 --> 00:47:01.148 and and I think there was another there.
NOTE Confidence: 0.84977918

00:47:01.150 --> 00:47:03.842 There was a study that showed the
NOTE Confidence: 0.84977918

00:47:03.842 --> 00:47:06.072 initiation of symptoms and that
NOTE Confidence: 0.84977918

00:47:06.072 --> 00:47:08.988 the time between the initiation of
NOTE Confidence: 0.84977918

00:47:08.988 --> 00:47:11.483 symptoms and the official diagnosis
NOTE Confidence: 0.84977918

00:47:11.483 --> 00:47:14.149 whatever was about maybe 11 years.
NOTE Confidence: 0.84977918

00:47:14.150 --> 00:47:16.348 So by that time the arousal may
NOTE Confidence: 0.84977918

00:47:16.348 --> 00:47:18.110 not be informative any anymore.
NOTE Confidence: 0.84977918

00:47:18.110 --> 00:47:22.135 So and in terms of risk prediction.
NOTE Confidence: 0.84977918

00:47:22.140 --> 00:47:23.133 So that's that.
NOTE Confidence: 0.84977918

00:47:23.133 --> 00:47:25.119 I need to make that clear
NOTE Confidence: 0.84977918

00:47:25.119 --> 00:47:26.960 so it doesn't predict.
NOTE Confidence: 0.84977918

00:47:26.960 --> 00:47:30.432 Addition the added risk and top of
NOTE Confidence: 0.84977918

00:47:30.432 --> 00:47:33.260 desaturation based on these studies.

NOTE Confidence: 0.83314257375
00:47:35.740 --> 00:47:36.965 I'm going to go back to Doctor
NOTE Confidence: 0.83314257375
00:47:36.965 --> 00:47:38.082 Hoffman, doctor Yaggi said.
NOTE Confidence: 0.83314257375
00:47:38.082 --> 00:47:39.652 Do we know the relationship
NOTE Confidence: 0.83314257375
00:47:39.652 --> 00:47:41.007 between arousal threshold and
NOTE Confidence: 0.83314257375
00:47:41.007 --> 00:47:42.355 delta heart rate response?
NOTE Confidence: 0.826461641666667
00:47:44.630 --> 00:47:48.260 No, I haven't done that study.
NOTE Confidence: 0.826461641666667
00:47:48.260 --> 00:47:51.214 So arousal threshold and delta heart rate,
NOTE Confidence: 0.826461641666667
00:47:51.220 --> 00:47:52.756 no, I don't. I don't know.
NOTE Confidence: 0.826461641666667
00:47:52.760 --> 00:47:55.190 But yeah, we can, we can look at it.
NOTE Confidence: 0.696003746
00:47:56.790 --> 00:47:58.498 And then, doctor Huff. Oh, go ahead. Sorry.
NOTE Confidence: 0.924252985
00:47:59.370 --> 00:48:02.256 No, I was just curious why.
NOTE Confidence: 0.924252985
00:48:02.260 --> 00:48:04.108 Like the gag is interested in this.
NOTE Confidence: 0.831150406666667
00:48:04.900 --> 00:48:06.562 Please unmute and and let us
NOTE Confidence: 0.831150406666667
00:48:06.562 --> 00:48:08.190 know Doctor Yaggi if you can.
NOTE Confidence: 0.9154247
00:48:10.210 --> 00:48:10.580 OK.
NOTE Confidence: 0.86617491875

00:48:13.030 --> 00:48:15.342 And then Doctor Hoffman, if you want to
NOTE Confidence: 0.86617491875

00:48:15.342 --> 00:48:17.635 unmute to ask or to make your comment,
NOTE Confidence: 0.668786885

00:48:17.970 --> 00:48:20.998 I bring that up just because the
NOTE Confidence: 0.668786885

00:48:20.998 --> 00:48:23.806 work that Andre has done has
NOTE Confidence: 0.668786885

00:48:23.806 --> 00:48:26.430 shown that low arousal threshold,
NOTE Confidence: 0.668786885

00:48:26.430 --> 00:48:29.051 the patients really struggle adhering
NOTE Confidence: 0.668786885

00:48:29.051 --> 00:48:33.608 to CPAP therapy and we're finding that.
NOTE Confidence: 0.668786885

00:48:33.610 --> 00:48:35.030 The arousal threshold
NOTE Confidence: 0.85876328

00:48:35.040 --> 00:48:37.576 and autonomic activity might be
NOTE Confidence: 0.85876328

00:48:37.576 --> 00:48:39.790 related that it might be challenging
NOTE Confidence: 0.824803240588235

00:48:39.800 --> 00:48:42.236 to treat those patients with delta
NOTE Confidence: 0.824803240588235

00:48:42.236 --> 00:48:44.751 heart rate response if they if
NOTE Confidence: 0.824803240588235

00:48:44.751 --> 00:48:46.786 it's an arousal threshold issue.
NOTE Confidence: 0.853389127777778

00:48:48.310 --> 00:48:49.926 That's interesting. Sure. Yeah,
NOTE Confidence: 0.853389127777778

00:48:49.926 --> 00:48:52.890 we should look at it. We have the data.
NOTE Confidence: 0.885822016923077

00:48:54.700 --> 00:48:56.440 Doctor Hoffman wanted to point out

NOTE Confidence: 0.885822016923077
00:48:56.440 --> 00:48:58.397 that using heart rate response can be
NOTE Confidence: 0.885822016923077
00:48:58.397 --> 00:49:00.563 tricky when we don't know if the patient
NOTE Confidence: 0.885822016923077
00:49:00.563 --> 00:49:02.418 has a cardiac autonomic neuropathy,
NOTE Confidence: 0.885822016923077
00:49:02.420 --> 00:49:05.284 which is not uncommon in patients with type
NOTE Confidence: 0.885822016923077
00:49:05.284 --> 00:49:08.068 2 diabetes and and as patients are aging.
NOTE Confidence: 0.848992425
00:49:10.510 --> 00:49:13.060 I don't know if you have a comment for that.
NOTE Confidence: 0.817764682857143
00:49:14.500 --> 00:49:17.600 I mean I don't have a comments, but I agree.
NOTE Confidence: 0.817764682857143
00:49:17.600 --> 00:49:19.980 Yes, yeah, in in some patient
NOTE Confidence: 0.817764682857143
00:49:19.980 --> 00:49:21.605 population it may be challenging
NOTE Confidence: 0.817764682857143
00:49:21.605 --> 00:49:23.677 to measure heart rate response,
NOTE Confidence: 0.817764682857143
00:49:23.680 --> 00:49:25.420 but we haven't had any issue
NOTE Confidence: 0.817764682857143
00:49:25.420 --> 00:49:27.160 in in this large cohorts,
NOTE Confidence: 0.817764682857143
00:49:27.160 --> 00:49:28.585 population based cohorts.
NOTE Confidence: 0.817764682857143
00:49:28.585 --> 00:49:31.435 In terms of measurements of delta,
NOTE Confidence: 0.817764682857143
00:49:31.440 --> 00:49:32.328 heart rates and.
NOTE Confidence: 0.727948564

00:49:34.110 --> 00:49:35.340 And Doctor Winkleman, do you
NOTE Confidence: 0.727948564

00:49:35.340 --> 00:49:36.570 wanna unmute for your question?
NOTE Confidence: 0.727948564

00:49:36.570 --> 00:49:38.154 It's a little bit longer if you'd like.
NOTE Confidence: 0.713156518

00:49:45.720 --> 00:49:49.380 Thank you. Great talk, Ollie.
NOTE Confidence: 0.713156518

00:49:49.380 --> 00:49:50.836 Progression of.
NOTE Confidence: 0.713156518

00:49:50.836 --> 00:49:55.204 A very logical approach to this.
NOTE Confidence: 0.713156518

00:49:55.210 --> 00:49:57.890 I think from my perspective
NOTE Confidence: 0.713156518

00:49:57.890 --> 00:50:01.430 the next step is looking at
NOTE Confidence: 0.713156518

00:50:01.430 --> 00:50:03.790 respiratory related leg movements.
NOTE Confidence: 0.713156518

00:50:03.790 --> 00:50:05.490 Those leg movements that occur
NOTE Confidence: 0.713156518

00:50:05.490 --> 00:50:07.575 at the end of respiratory events
NOTE Confidence: 0.713156518

00:50:07.575 --> 00:50:09.471 that have been shown when they
NOTE Confidence: 0.713156518

00:50:09.471 --> 00:50:11.652 are present to be associated with
NOTE Confidence: 0.713156518

00:50:11.652 --> 00:50:13.208 a substantially larger increase
NOTE Confidence: 0.713156518

00:50:13.208 --> 00:50:16.192 in heart rate than events that do
NOTE Confidence: 0.713156518

00:50:16.192 --> 00:50:18.910 not terminate in the leg movement.

NOTE Confidence: 0.713156518

00:50:18.910 --> 00:50:22.094 Do you have any plans to investigate this?

NOTE Confidence: 0.787001731428571

00:50:23.330 --> 00:50:24.905 Absolutely. I mean, we are doing that.

NOTE Confidence: 0.865773413333333

00:50:26.920 --> 00:50:29.710 That's a good time to ask this question.

NOTE Confidence: 0.508947294

00:50:30.900 --> 00:50:32.890 We're trying and trying to

NOTE Confidence: 0.71576542

00:50:32.900 --> 00:50:36.740 have some data. To analyze that data

NOTE Confidence: 0.71576542

00:50:36.740 --> 00:50:39.040 and hopefully, yeah, collaborates.

NOTE Confidence: 0.7995307275

00:50:39.810 --> 00:50:41.880 Thank you. Great talk. Thank you.

NOTE Confidence: 0.55164334

00:50:43.920 --> 00:50:47.220 And uh, Doctor Thomas ask,

NOTE Confidence: 0.55164334

00:50:47.220 --> 00:50:49.159 how does one use these insights in

NOTE Confidence: 0.55164334

00:50:49.159 --> 00:50:51.120 the management of individual patients?

NOTE Confidence: 0.55164334

00:50:51.120 --> 00:50:53.633 So you've shown a group analysis with

NOTE Confidence: 0.55164334

00:50:53.633 --> 00:50:56.137 with large cohorts of patients and do

NOTE Confidence: 0.55164334

00:50:56.137 --> 00:50:58.541 you have any recommendations to us to

NOTE Confidence: 0.55164334

00:50:58.541 --> 00:51:00.620 tailor this clinically at this point?

NOTE Confidence: 0.688641834

00:51:01.460 --> 00:51:03.370 I don't, I don't. Yeah.

NOTE Confidence: 0.688641834

00:51:03.370 --> 00:51:04.980 That's that's too, too early.
NOTE Confidence: 0.688641834

00:51:04.980 --> 00:51:06.105 Probably it's too early.
NOTE Confidence: 0.688641834

00:51:06.105 --> 00:51:06.990 Yeah. Yeah. Yeah.
NOTE Confidence: 0.84852726117647

00:51:08.520 --> 00:51:11.628 Um. And then someone is asking arousal
NOTE Confidence: 0.84852726117647

00:51:11.628 --> 00:51:14.139 response is related to obstructive
NOTE Confidence: 0.84852726117647

00:51:14.139 --> 00:51:16.874 sleep apnea syndrome or neuropathy?
NOTE Confidence: 0.835249628333333

00:51:19.250 --> 00:51:21.914 Uh, if you want to unmute, it's CAI.
NOTE Confidence: 0.835249628333333

00:51:21.914 --> 00:51:25.568 If you want to unmute and and.
NOTE Confidence: 0.835249628333333

00:51:25.570 --> 00:51:27.496 Clarify the question would be great.
NOTE Confidence: 0.808409268571429

00:51:43.140 --> 00:51:44.918 Is that Alice Kai? I'm not sure.
NOTE Confidence: 0.786693958333333

00:51:47.690 --> 00:51:50.930 Alice, you want to unmute and.
NOTE Confidence: 0.786693958333333

00:51:50.930 --> 00:51:54.822 Alright. Yes, I just want to know
NOTE Confidence: 0.786693958333333

00:51:54.822 --> 00:51:57.460 um arouse response is result
NOTE Confidence: 0.786693958333333

00:51:57.460 --> 00:52:00.580 is related to the authors or
NOTE Confidence: 0.786693958333333

00:52:00.580 --> 00:52:05.360 maybe from the central obstacles
NOTE Confidence: 0.786693958333333

00:52:05.360 --> 00:52:08.980 central right you're passing?

NOTE Confidence: 0.7866939583333333
00:52:08.980 --> 00:52:11.038 Central sleep apnea.
NOTE Confidence: 0.924206914
00:52:15.530 --> 00:52:17.030 Can you clarify again? Sorry,
NOTE Confidence: 0.924206914
00:52:17.030 --> 00:52:20.796 we had a little difficulty hearing you.
NOTE Confidence: 0.924206914
00:52:20.800 --> 00:52:25.510 Means uh arouse response is related
NOTE Confidence: 0.924206914
00:52:25.510 --> 00:52:29.668 to obstruct sleep as clear syndrome
NOTE Confidence: 0.924206914
00:52:29.668 --> 00:52:32.903 or symptoms sleep aspirator syndrome.
NOTE Confidence: 0.80109592625
00:52:33.320 --> 00:52:37.030 We only looked at the obstructive sleep
NOTE Confidence: 0.80109592625
00:52:37.030 --> 00:52:41.560 apnea. We didn't get this central.
NOTE Confidence: 0.80109592625
00:52:41.560 --> 00:52:43.726 And their central events were very
NOTE Confidence: 0.80109592625
00:52:43.726 --> 00:52:46.129 rare actually in these these cohorts.
NOTE Confidence: 0.83640089047619
00:52:50.010 --> 00:52:51.494 Doctor Yaggi, I'm going to ask you
NOTE Confidence: 0.83640089047619
00:52:51.494 --> 00:52:53.321 to any new again as well to share
NOTE Confidence: 0.83640089047619
00:52:53.321 --> 00:52:54.740 your comment if you don't mind.
NOTE Confidence: 0.894891818
00:52:56.670 --> 00:52:58.410 Yeah. One one other question.
NOTE Confidence: 0.894891818
00:52:58.410 --> 00:53:00.290 I'll leave this unbelievable work.
NOTE Confidence: 0.894891818

00:53:00.290 --> 00:53:03.146 Thank you for sharing this with us today.
NOTE Confidence: 0.894891818

00:53:03.150 --> 00:53:04.988 It seemed like in the analysis
NOTE Confidence: 0.894891818

00:53:04.988 --> 00:53:06.950 you did looking at Delta heart
NOTE Confidence: 0.894891818

00:53:07.024 --> 00:53:09.209 rate in the observational studies,
NOTE Confidence: 0.894891818

00:53:09.210 --> 00:53:10.992 I think it was sleep heart health,
NOTE Confidence: 0.894891818

00:53:10.992 --> 00:53:13.770 Mr Ross Mesa where it's at a low,
NOTE Confidence: 0.894891818

00:53:13.770 --> 00:53:16.254 medium, high heart rate cut points
NOTE Confidence: 0.894891818

00:53:16.254 --> 00:53:18.874 where you dichotomize this and the
NOTE Confidence: 0.894891818

00:53:18.874 --> 00:53:21.996 CPAP analysis for ricotta using
NOTE Confidence: 0.894891818

00:53:21.996 --> 00:53:24.848 different different cut points.
NOTE Confidence: 0.894891818

00:53:24.850 --> 00:53:26.426 And I'm just wondering.
NOTE Confidence: 0.894891818

00:53:26.426 --> 00:53:29.220 The reason behind that was that yeah,
NOTE Confidence: 0.894891818

00:53:29.220 --> 00:53:31.340 how did you come up with those cut points
NOTE Confidence: 0.894891818

00:53:31.340 --> 00:53:34.288 and ricotta versus versus the other
NOTE Confidence: 0.730518197142857

00:53:34.300 --> 00:53:38.115 side. So sure. Thank you for comments.
NOTE Confidence: 0.730518197142857

00:53:38.120 --> 00:53:40.808 So basically in in sleep in Mesa

NOTE Confidence: 0.730518197142857
00:53:40.808 --> 00:53:43.048 and sleep Heart health actually
NOTE Confidence: 0.730518197142857
00:53:43.048 --> 00:53:46.576 in Mesa we looked at this U-shaped
NOTE Confidence: 0.730518197142857
00:53:46.576 --> 00:53:48.600 relationship and based on that.
NOTE Confidence: 0.730518197142857
00:53:48.600 --> 00:53:52.184 We just categorize based on the
NOTE Confidence: 0.730518197142857
00:53:52.184 --> 00:53:56.955 top 25% and and lower 25% and
NOTE Confidence: 0.730518197142857
00:53:56.955 --> 00:54:00.165 the middle was the middle 50%.
NOTE Confidence: 0.730518197142857
00:54:00.170 --> 00:54:01.920 And and then we use the same
NOTE Confidence: 0.730518197142857
00:54:01.920 --> 00:54:03.160 threshold in sleep Charter.
NOTE Confidence: 0.730518197142857
00:54:03.160 --> 00:54:04.850 So we didn't change the
NOTE Confidence: 0.730518197142857
00:54:04.850 --> 00:54:06.202 threshold in sleep harthouse.
NOTE Confidence: 0.730518197142857
00:54:06.210 --> 00:54:08.046 In regards to the,
NOTE Confidence: 0.730518197142857
00:54:08.046 --> 00:54:10.341 the question was different actually
NOTE Confidence: 0.730518197142857
00:54:10.341 --> 00:54:12.884 it's because we hypothesize that
NOTE Confidence: 0.730518197142857
00:54:12.884 --> 00:54:15.274 those with higher heart rate
NOTE Confidence: 0.730518197142857
00:54:15.274 --> 00:54:17.484 response those would benefit more
NOTE Confidence: 0.730518197142857

00:54:17.484 --> 00:54:20.509 and and we test it as a linear.
NOTE Confidence: 0.730518197142857

00:54:20.510 --> 00:54:21.566 So we test it as a.
NOTE Confidence: 0.730518197142857

00:54:21.570 --> 00:54:23.859 We didn't in the main analysis we
NOTE Confidence: 0.730518197142857

00:54:23.859 --> 00:54:26.601 it was a continuous variable and
NOTE Confidence: 0.730518197142857

00:54:26.601 --> 00:54:27.747 we showed that there was that,
NOTE Confidence: 0.730518197142857

00:54:27.750 --> 00:54:30.826 I showed the point estimates and the.
NOTE Confidence: 0.730518197142857

00:54:30.826 --> 00:54:32.560 The the binary.
NOTE Confidence: 0.730518197142857

00:54:32.560 --> 00:54:34.930 Categorization that was just just to
NOTE Confidence: 0.730518197142857

00:54:34.930 --> 00:54:37.783 show that you see the same thing if
NOTE Confidence: 0.730518197142857

00:54:37.783 --> 00:54:40.680 you divide it by a nice around number,
NOTE Confidence: 0.730518197142857

00:54:40.680 --> 00:54:43.550 like 6 beats per minute.
NOTE Confidence: 0.730518197142857

00:54:43.550 --> 00:54:45.272 And and and there is also a
NOTE Confidence: 0.730518197142857

00:54:45.272 --> 00:54:47.050 difference in the in the population.
NOTE Confidence: 0.730518197142857

00:54:47.050 --> 00:54:49.066 So in the recuts I think it was
NOTE Confidence: 0.730518197142857

00:54:49.070 --> 00:54:53.665 90% or maybe 80% had cardiac,
NOTE Confidence: 0.730518197142857

00:54:53.665 --> 00:54:56.205 cardiac problems and about

NOTE Confidence: 0.730518197142857
00:54:56.205 --> 00:54:59.180 90% were on beta blockers so.
NOTE Confidence: 0.730518197142857
00:54:59.180 --> 00:55:01.098 It would be a different population compared
NOTE Confidence: 0.730518197142857
00:55:01.098 --> 00:55:03.168 to State Park health and other records.
NOTE Confidence: 0.817095533333333
00:55:07.790 --> 00:55:09.908 Sorry, I couldn't hear the rest.
NOTE Confidence: 0.665457941666667
00:55:11.200 --> 00:55:12.430 Or Andre, feel free to unmute,
NOTE Confidence: 0.665457941666667
00:55:12.430 --> 00:55:14.010 unmute if you wanna.
NOTE Confidence: 0.608715973333333
00:55:14.120 --> 00:55:15.626 No sure. So I'll, I'll leave.
NOTE Confidence: 0.608715973333333
00:55:15.630 --> 00:55:19.386 Great, great work and like Doctor
NOTE Confidence: 0.608715973333333
00:55:19.386 --> 00:55:21.582 Wickman said are really nice and
NOTE Confidence: 0.608715973333333
00:55:21.582 --> 00:55:23.346 elegant progression of going from
NOTE Confidence: 0.608715973333333
00:55:23.346 --> 00:55:25.398 HIV to these more continuous metrics,
NOTE Confidence: 0.608715973333333
00:55:25.400 --> 00:55:26.288 which is really nice.
NOTE Confidence: 0.608715973333333
00:55:26.288 --> 00:55:28.739 And I guess I have a couple of questions.
NOTE Confidence: 0.608715973333333
00:55:28.740 --> 00:55:30.060 One question is?
NOTE Confidence: 0.608715973333333
00:55:30.060 --> 00:55:32.072 You know, I think that, Umm,
NOTE Confidence: 0.608715973333333

00:55:32.072 --> 00:55:33.204 the markers you've developed
NOTE Confidence: 0.6087159733333333

00:55:33.204 --> 00:55:34.879 are very promising and I'm just
NOTE Confidence: 0.6087159733333333

00:55:34.879 --> 00:55:36.733 wondering if you were to take it
NOTE Confidence: 0.6087159733333333

00:55:36.733 --> 00:55:38.287 to the next level or someone else
NOTE Confidence: 0.6087159733333333

00:55:38.287 --> 00:55:40.096 were to take it to the next level.
NOTE Confidence: 0.6087159733333333

00:55:40.100 --> 00:55:41.270 You know what,
NOTE Confidence: 0.6087159733333333

00:55:41.270 --> 00:55:43.663 I'm going to sort of piggyback
NOTE Confidence: 0.6087159733333333

00:55:43.663 --> 00:55:44.992 on Clara's question.
NOTE Confidence: 0.6087159733333333

00:55:44.992 --> 00:55:47.380 You know, how do we design a trial
NOTE Confidence: 0.6087159733333333

00:55:47.380 --> 00:55:49.646 where we look at people most at risk
NOTE Confidence: 0.6087159733333333

00:55:49.646 --> 00:55:52.000 or most likely to respond for example.
NOTE Confidence: 0.6087159733333333

00:55:52.000 --> 00:55:54.520 So what delta heart rate caught up do we use?
NOTE Confidence: 0.6087159733333333

00:55:54.520 --> 00:55:56.557 Do you think we need to validate
NOTE Confidence: 0.6087159733333333

00:55:56.557 --> 00:55:58.205 this more in other populations
NOTE Confidence: 0.6087159733333333

00:55:58.205 --> 00:56:00.335 before you have a cut off?
NOTE Confidence: 0.6087159733333333

00:56:00.340 --> 00:56:01.960 How can we operationalize that to

NOTE Confidence: 0.6087159733333333
00:56:01.960 --> 00:56:04.446 the point where we can perform a
NOTE Confidence: 0.6087159733333333
00:56:04.446 --> 00:56:06.474 trial that's a little bit more?
NOTE Confidence: 0.6087159733333333
00:56:06.480 --> 00:56:08.050 Umm.
NOTE Confidence: 0.6087159733333333
00:56:08.050 --> 00:56:08.840 Successful.
NOTE Confidence: 0.81544888625
00:56:10.520 --> 00:56:13.679 Yes, we are trying to to do that trial
NOTE Confidence: 0.81544888625
00:56:13.679 --> 00:56:16.701 and submit the proposal and hopefully
NOTE Confidence: 0.81544888625
00:56:16.701 --> 00:56:19.944 get that fund that's for the delta
NOTE Confidence: 0.81544888625
00:56:19.944 --> 00:56:23.329 heart rates and we proposed that delta
NOTE Confidence: 0.81544888625
00:56:23.329 --> 00:56:27.243 heart rate of 6 beats per minute. OK.
NOTE Confidence: 0.81544888625
00:56:27.243 --> 00:56:30.081 Because again we're going to recruit
NOTE Confidence: 0.81544888625
00:56:30.081 --> 00:56:32.480 from cardiology clinic most likely.
NOTE Confidence: 0.81544888625
00:56:32.480 --> 00:56:35.495 And yes, that's I'm going to use the same,
NOTE Confidence: 0.81544888625
00:56:35.500 --> 00:56:41.068 the same threshold that that was in bukasa.
NOTE Confidence: 0.81544888625
00:56:41.070 --> 00:56:42.960 You know. So.
NOTE Confidence: 0.7412148
00:56:43.880 --> 00:56:46.520 OK. All right.
NOTE Confidence: 0.7412148

00:56:46.520 --> 00:56:48.370 Three of six cardiac population.
NOTE Confidence: 0.7412148

00:56:48.370 --> 00:56:50.001 Here we go. All right, excellent.
NOTE Confidence: 0.7412148

00:56:50.001 --> 00:56:53.880 And I guess the other question I had was?
NOTE Confidence: 0.7412148

00:56:53.880 --> 00:56:56.358 In regards to your more recent work
NOTE Confidence: 0.7412148

00:56:56.358 --> 00:56:58.620 where you're looking at the risk
NOTE Confidence: 0.7412148

00:56:58.620 --> 00:57:00.515 of adverse outcomes and different
NOTE Confidence: 0.7412148

00:57:00.515 --> 00:57:02.919 definitions of the HIV that we could
NOTE Confidence: 0.7412148

00:57:02.919 --> 00:57:04.931 extract from the routine PhD data
NOTE Confidence: 0.7412148

00:57:04.931 --> 00:57:07.517 without having to use signal processing.
NOTE Confidence: 0.7412148

00:57:07.520 --> 00:57:10.424 And so when you're looking at events that
NOTE Confidence: 0.7412148

00:57:10.424 --> 00:57:12.910 are associated only with arousals versus,
NOTE Confidence: 0.7412148

00:57:12.910 --> 00:57:14.580 those are the 3% disabled.
NOTE Confidence: 0.7412148

00:57:14.580 --> 00:57:16.464 So in that population,
NOTE Confidence: 0.7412148

00:57:16.464 --> 00:57:19.290 what was the distribution of the
NOTE Confidence: 0.7412148

00:57:19.380 --> 00:57:22.380 events that were associated with 3%
NOTE Confidence: 0.7412148

00:57:22.380 --> 00:57:24.036 dsat versus events with just the?

NOTE Confidence: 0.7412148

00:57:24.040 --> 00:57:26.570 There's always is arousals alone,

NOTE Confidence: 0.7412148

00:57:26.570 --> 00:57:28.240 minority of events or whether

NOTE Confidence: 0.773825461818182

00:57:28.250 --> 00:57:29.852 I think I showed that in

NOTE Confidence: 0.773825461818182

00:57:29.852 --> 00:57:31.470 the one of the tables,

NOTE Confidence: 0.773825461818182

00:57:31.470 --> 00:57:37.430 I think yes, about 15% or so,

NOTE Confidence: 0.773825461818182

00:57:37.430 --> 00:57:39.458 yes, only arousal notice,

NOTE Confidence: 0.7534377

00:57:40.490 --> 00:57:44.170 right? So in your analysis you

NOTE Confidence: 0.7534377

00:57:44.170 --> 00:57:46.090 essentially you add her on the

NOTE Confidence: 0.7534377

00:57:46.090 --> 00:57:48.755 arousal frequency really you know

NOTE Confidence: 0.7534377

00:57:48.755 --> 00:57:51.420 register event related arousals or

NOTE Confidence: 0.7534377

00:57:51.501 --> 00:57:54.006 you know hoping really arousals.

NOTE Confidence: 0.7534377

00:57:54.010 --> 00:57:56.494 The total amount of the exposure

NOTE Confidence: 0.7534377

00:57:56.494 --> 00:57:58.659 that's already there with the 3%

NOTE Confidence: 0.66244868

00:57:58.850 --> 00:58:01.340 exactly and that's exactly what we did, yes.

NOTE Confidence: 0.806172926923077

00:58:03.010 --> 00:58:04.599 All right. And one of the other

NOTE Confidence: 0.806172926923077

00:58:04.599 --> 00:58:06.130 things I might suggest is that,
NOTE Confidence: 0.806172926923077

00:58:06.130 --> 00:58:08.125 you know, as we look at these
NOTE Confidence: 0.806172926923077

00:58:08.130 --> 00:58:09.252 different different studies,
NOTE Confidence: 0.806172926923077

00:58:09.252 --> 00:58:12.256 one of the key pieces of information is
NOTE Confidence: 0.806172926923077

00:58:12.256 --> 00:58:14.224 that often we use composite outcomes,
NOTE Confidence: 0.806172926923077

00:58:14.230 --> 00:58:17.054 you know, CAD stroke and they actually might
NOTE Confidence: 0.806172926923077

00:58:17.054 --> 00:58:19.557 be different mechanisms for those events.
NOTE Confidence: 0.806172926923077

00:58:19.560 --> 00:58:21.690 And similarly, you know, maybe the
NOTE Confidence: 0.806172926923077

00:58:21.690 --> 00:58:24.970 arousals may be more relevant for you know,
NOTE Confidence: 0.806172926923077

00:58:24.970 --> 00:58:27.520 cognition or rather than CVD.
NOTE Confidence: 0.806172926923077

00:58:27.520 --> 00:58:29.606 And so there's some data I think
NOTE Confidence: 0.806172926923077

00:58:29.606 --> 00:58:32.938 from Stanford looking at the.
NOTE Confidence: 0.806172926923077

00:58:32.940 --> 00:58:35.300 Hypopneas with arousals only would
NOTE Confidence: 0.806172926923077

00:58:35.300 --> 00:58:37.188 be correlating this objectives.
NOTE Confidence: 0.745940028571429

00:58:38.580 --> 00:58:40.274 I mean, we looked at the ESS,
NOTE Confidence: 0.745940028571429

00:58:40.280 --> 00:58:41.864 but you're right, yes.

NOTE Confidence: 0.745940028571429
00:58:41.864 --> 00:58:44.240 So we should look at other
NOTE Confidence: 0.745940028571429
00:58:44.240 --> 00:58:45.892 outcomes that are available,
NOTE Confidence: 0.745940028571429
00:58:45.892 --> 00:58:48.752 I think, yeah. Unfortunately,
NOTE Confidence: 0.745940028571429
00:58:48.752 --> 00:58:51.648 in this course is I think ES was
NOTE Confidence: 0.745940028571429
00:58:51.650 --> 00:58:53.106 the only one we could look at.
NOTE Confidence: 0.879131338888889
00:58:56.560 --> 00:58:59.014 Our next question asks what clinical
NOTE Confidence: 0.879131338888889
00:58:59.014 --> 00:59:00.650 parameters would help delineate
NOTE Confidence: 0.879131338888889
00:59:00.711 --> 00:59:02.891 individuals more likely to have
NOTE Confidence: 0.879131338888889
00:59:02.891 --> 00:59:04.573 significant hypoxic burden when
NOTE Confidence: 0.879131338888889
00:59:04.573 --> 00:59:06.438 they're being evaluated and in.
NOTE Confidence: 0.64747655
00:59:07.590 --> 00:59:13.096 So. So the. In terms of the,
NOTE Confidence: 0.64747655
00:59:13.096 --> 00:59:16.199 so you mean people with maybe high HIV,
NOTE Confidence: 0.64747655
00:59:16.200 --> 00:59:18.228 high Tina, is that the question?
NOTE Confidence: 0.900037463333333
00:59:19.680 --> 00:59:21.345 Please feel free to unmute
NOTE Confidence: 0.900037463333333
00:59:21.345 --> 00:59:22.677 the individual asking this.
NOTE Confidence: 0.900037463333333

00:59:22.680 --> 00:59:23.536 I think they mean.
NOTE Confidence: 0.9000374633333333

00:59:23.536 --> 00:59:25.359 I'm wondering if they mean in the clinic.
NOTE Confidence: 0.9000374633333333

00:59:25.360 --> 00:59:27.796 Are there any characteristics we can
NOTE Confidence: 0.9000374633333333

00:59:27.796 --> 00:59:30.939 use to to sort of identify those?
NOTE Confidence: 0.9000374633333333

00:59:30.940 --> 00:59:31.980 But I could be wrong.
NOTE Confidence: 0.532192965

00:59:35.900 --> 00:59:36.350 That's from
NOTE Confidence: 0.9391283

00:59:38.700 --> 00:59:39.180 EN 12901.
NOTE Confidence: 0.91319767

00:59:41.850 --> 00:59:44.694 I mean if you see a lot of events.
NOTE Confidence: 0.91319767

00:59:44.700 --> 00:59:46.210 A lot of these saturation,
NOTE Confidence: 0.5434703633333333

00:59:46.680 --> 00:59:49.740 I mean in that meeting before before
NOTE Confidence: 0.5434703633333333

00:59:49.740 --> 00:59:52.267 actually the study like you in the clinic
NOTE Confidence: 0.5434703633333333

00:59:52.267 --> 00:59:55.789 you evaluating a you know patient.
NOTE Confidence: 0.5434703633333333

00:59:55.790 --> 00:59:58.174 You know I understand that you know all
NOTE Confidence: 0.867809305714286

00:59:58.190 --> 01:00:00.409 that is from the study but you
NOTE Confidence: 0.761775822857143

01:00:00.420 --> 01:00:02.340 know clinically if we evaluating
NOTE Confidence: 0.761775822857143

01:00:02.340 --> 01:00:05.031 patients since they are you know pack

NOTE Confidence: 0.761775822857143

01:00:05.031 --> 01:00:08.290 some car clinic or characteristics that

NOTE Confidence: 0.9380817425

01:00:08.290 --> 01:00:10.760 you know we could. Basically,

NOTE Confidence: 0.634187102

01:00:10.830 --> 01:00:12.870 I derive from the studies

NOTE Confidence: 0.634187102

01:00:12.870 --> 01:00:14.330 that would predict that those

NOTE Confidence: 0.634187102

01:00:14.330 --> 01:00:17.750 individuals are more likely to

NOTE Confidence: 0.634187102

01:00:17.750 --> 01:00:20.486 have significant hypoxic burden.

NOTE Confidence: 0.634187102

01:00:20.490 --> 01:00:22.850 Done that that study.

NOTE Confidence: 0.772773746666667

01:00:25.390 --> 01:00:27.375 You showed that abdominal adiposity

NOTE Confidence: 0.772773746666667

01:00:27.375 --> 01:00:28.963 wasn't associated with it,

NOTE Confidence: 0.772773746666667

01:00:28.970 --> 01:00:31.749 but were there any other anything like?

NOTE Confidence: 0.772773746666667

01:00:31.750 --> 01:00:34.000 Any characteristics?

NOTE Confidence: 0.86614173

01:00:35.890 --> 01:00:38.514 To some extent. Uh.

NOTE Confidence: 0.86614173

01:00:38.514 --> 01:00:41.238 Which is related to both sleep

NOTE Confidence: 0.86614173

01:00:41.238 --> 01:00:43.812 apnea and also maybe just

NOTE Confidence: 0.86614173

01:00:43.812 --> 01:00:46.036 adding some more hypoxia.

NOTE Confidence: 0.86614173

01:00:46.040 --> 01:00:47.690 By lowering the lung volume.
NOTE Confidence: 0.694157354444444

01:00:50.190 --> 01:00:52.454 I think you have BMI was the only
NOTE Confidence: 0.694157354444444

01:00:52.454 --> 01:00:54.498 factor that remained significant after
NOTE Confidence: 0.694157354444444

01:00:54.498 --> 01:00:56.853 it's just include the covariance.
NOTE Confidence: 0.86437678

01:01:00.220 --> 01:01:01.940 Ali, thank you so much.
NOTE Confidence: 0.86437678

01:01:01.940 --> 01:01:05.460 What a great talk and thank you, so good
NOTE Confidence: 0.86437678

01:01:05.460 --> 01:01:08.360 for hosting a lot of outstanding data,
NOTE Confidence: 0.86437678

01:01:08.360 --> 01:01:10.796 a lot of promising directions and
NOTE Confidence: 0.86437678

01:01:10.796 --> 01:01:13.404 looking forward to hearing from you in
NOTE Confidence: 0.86437678

01:01:13.404 --> 01:01:15.901 a couple of years when you update us
NOTE Confidence: 0.86437678

01:01:15.901 --> 01:01:18.245 and tell us that you figured it out.
NOTE Confidence: 0.86437678

01:01:18.250 --> 01:01:20.374 And looking forward to our next
NOTE Confidence: 0.86437678

01:01:20.374 --> 01:01:22.427 session that we presented by our
NOTE Confidence: 0.86437678

01:01:22.427 --> 01:01:23.847 own doctor minor at Yale,
NOTE Confidence: 0.86437678

01:01:23.850 --> 01:01:26.130 we'll be talking about sleep
NOTE Confidence: 0.86437678

01:01:26.130 --> 01:01:28.410 disturbance in the elderly population,

NOTE Confidence: 0.86437678

01:01:28.410 --> 01:01:29.988 something that we see fairly commonly.

NOTE Confidence: 0.86437678

01:01:29.990 --> 01:01:31.382 And so thank you everyone for

NOTE Confidence: 0.86437678

01:01:31.382 --> 01:01:32.745 spending your time with us today

NOTE Confidence: 0.86437678

01:01:32.745 --> 01:01:34.103 and we'll see you in one month.

NOTE Confidence: 0.95441792

01:01:35.230 --> 01:01:36.833 Thank you so much for hosting.

NOTE Confidence: 0.95441792

01:01:36.833 --> 01:01:38.739 Bye, bye. Thank you. Bye.