

WEBVTT

NOTE duration:"01:03:34"

NOTE recognizability:0.793

NOTE language:en-us

NOTE Confidence: 0.934041

00:00:00.000 --> 00:00:00.740 This.

NOTE Confidence: 0.8024654

00:00:21.330 --> 00:00:23.646 Here we go. I think we have a

NOTE Confidence: 0.843023542

00:00:23.650 --> 00:00:25.730 lot of folks have joined.

NOTE Confidence: 0.843023542

00:00:25.730 --> 00:00:26.716 So hello everyone,

NOTE Confidence: 0.843023542

00:00:26.716 --> 00:00:29.014 my name is Andres and Chuck.

NOTE Confidence: 0.843023542

00:00:29.020 --> 00:00:30.796 I'm an assistant professor here at

NOTE Confidence: 0.843023542

00:00:30.796 --> 00:00:33.096 Yale School of Medicine and I want to

NOTE Confidence: 0.843023542

00:00:33.096 --> 00:00:35.210 welcome you to our another edition of

NOTE Confidence: 0.843023542

00:00:35.283 --> 00:00:37.857 Joint Sleep Seminar this afternoon and

NOTE Confidence: 0.843023542

00:00:37.857 --> 00:00:40.140 our inaugural session for the year.

NOTE Confidence: 0.843023542

00:00:40.140 --> 00:00:42.450 And then since our inception in 2018,

NOTE Confidence: 0.843023542

00:00:42.450 --> 00:00:44.934 we have grown quite a bit and now include

NOTE Confidence: 0.843023542

00:00:44.934 --> 00:00:46.782 many of the hospitals in Massachusetts.

NOTE Confidence: 0.843023542

00:00:46.790 --> 00:00:49.350 As you can see on this PowerPoint slide,

NOTE Confidence: 0.843023542

00:00:49.350 --> 00:00:51.470 Beth Israel mass general Tufts.

NOTE Confidence: 0.843023542

00:00:51.470 --> 00:00:52.542 Brigham Boston Medical Center

NOTE Confidence: 0.843023542

00:00:52.542 --> 00:00:55.360 and of course, Yale.

NOTE Confidence: 0.843023542

00:00:55.360 --> 00:00:57.256 So I just wanted to thank all of

NOTE Confidence: 0.843023542

00:00:57.256 --> 00:00:59.117 my colleagues at each of these

NOTE Confidence: 0.843023542

00:00:59.117 --> 00:01:00.119 participating institutions for

NOTE Confidence: 0.843023542

00:01:00.119 --> 00:01:02.159 helping make this conference reality,

NOTE Confidence: 0.843023542

00:01:02.160 --> 00:01:06.164 and they wanted to just say a couple of

NOTE Confidence: 0.843023542

00:01:06.164 --> 00:01:08.099 announcements for today before before.

NOTE Confidence: 0.843023542

00:01:08.100 --> 00:01:10.060 I'll have Eric introduce our

NOTE Confidence: 0.843023542

00:01:10.060 --> 00:01:12.008 speaker for the day first.

NOTE Confidence: 0.843023542

00:01:12.008 --> 00:01:13.898 Please take a moment to

NOTE Confidence: 0.843023542

00:01:13.898 --> 00:01:15.410 ensure that you're muted.

NOTE Confidence: 0.843023542

00:01:15.410 --> 00:01:19.218 And also this is a CME related conference,

NOTE Confidence: 0.843023542

00:01:19.220 --> 00:01:20.687 so if you wanted to get credit for it,

NOTE Confidence: 0.843023542
00:01:20.690 --> 00:01:22.657 please see the chat room for instructions
NOTE Confidence: 0.843023542
00:01:22.657 --> 00:01:25.429 and you can text the unique ID for the
NOTE Confidence: 0.843023542
00:01:25.429 --> 00:01:28.728 conference anytime between 1:45 and 3:15.
NOTE Confidence: 0.843023542
00:01:28.730 --> 00:01:29.894 If you do have questions and
NOTE Confidence: 0.843023542
00:01:29.894 --> 00:01:30.850 I hope that you do,
NOTE Confidence: 0.843023542
00:01:30.850 --> 00:01:32.738 I encourage you to make use of the
NOTE Confidence: 0.843023542
00:01:32.738 --> 00:01:34.718 chat room during the hour and then
NOTE Confidence: 0.843023542
00:01:34.718 --> 00:01:36.662 lastly the recorded versions of these
NOTE Confidence: 0.843023542
00:01:36.662 --> 00:01:38.747 talks will be available for a couple
NOTE Confidence: 0.843023542
00:01:38.747 --> 00:01:40.728 of weeks in the link provided in the chat,
NOTE Confidence: 0.843023542
00:01:40.730 --> 00:01:44.392 so please let's welcome Doctor.
NOTE Confidence: 0.843023542
00:01:44.392 --> 00:01:46.782 Eric Heckman and Doctor Magne
NOTE Confidence: 0.843023542
00:01:46.782 --> 00:01:49.209 units for our conference today.
NOTE Confidence: 0.843023542
00:01:49.210 --> 00:01:49.642 Go ahead,
NOTE Confidence: 0.843023542
00:01:49.642 --> 00:01:49.858 Eric.
NOTE Confidence: 0.875713675714286

00:01:51.020 --> 00:01:52.265 Good afternoon everyone.

NOTE Confidence: 0.875713675714286

00:01:52.265 --> 00:01:54.755 I have the distinct pleasure of

NOTE Confidence: 0.875713675714286

00:01:54.755 --> 00:01:56.757 introducing Dr Eunice this afternoon.

NOTE Confidence: 0.875713675714286

00:01:56.760 --> 00:02:00.281 He has a long track record in

NOTE Confidence: 0.875713675714286

00:02:00.281 --> 00:02:03.900 the sleep and pulmonary fields.

NOTE Confidence: 0.875713675714286

00:02:03.900 --> 00:02:05.580 He does medical training and

NOTE Confidence: 0.875713675714286

00:02:05.580 --> 00:02:07.260 public health training at the

NOTE Confidence: 0.875713675714286

00:02:07.324 --> 00:02:09.149 University of Alexandria in Egypt

NOTE Confidence: 0.875713675714286

00:02:09.149 --> 00:02:10.974 before coming over to Canada.

NOTE Confidence: 0.875713675714286

00:02:10.980 --> 00:02:13.782 There he did his clinical training

NOTE Confidence: 0.875713675714286

00:02:13.782 --> 00:02:15.650 at Montreal General Hospital

NOTE Confidence: 0.875713675714286

00:02:15.725 --> 00:02:18.420 as well as his PhD in pulmonary

NOTE Confidence: 0.875713675714286

00:02:18.420 --> 00:02:20.900 Physiology at McGill and after that.

NOTE Confidence: 0.875713675714286

00:02:20.900 --> 00:02:22.220 Advance steadily through

NOTE Confidence: 0.875713675714286

00:02:22.220 --> 00:02:23.980 the ranks of academia,

NOTE Confidence: 0.875713675714286

00:02:23.980 --> 00:02:26.240 holding titles of professor at

NOTE Confidence: 0.875713675714286
00:02:26.240 --> 00:02:28.500 both the University of Manitoba
NOTE Confidence: 0.875713675714286
00:02:28.574 --> 00:02:30.470 and University of Calgary.
NOTE Confidence: 0.875713675714286
00:02:30.470 --> 00:02:34.159 Uhm, he also has been the director
NOTE Confidence: 0.875713675714286
00:02:34.159 --> 00:02:36.650 of Sleep Laboratories in Winnipeg
NOTE Confidence: 0.875713675714286
00:02:36.650 --> 00:02:39.798 and has had a very profound research
NOTE Confidence: 0.875713675714286
00:02:39.798 --> 00:02:42.618 career covering many research topics
NOTE Confidence: 0.875713675714286
00:02:42.618 --> 00:02:44.927 ranging from respiratory mechanics
NOTE Confidence: 0.875713675714286
00:02:44.927 --> 00:02:47.647 and controlled breathing to exercise
NOTE Confidence: 0.875713675714286
00:02:47.647 --> 00:02:49.558 Physiology and pathogenesis of
NOTE Confidence: 0.875713675714286
00:02:49.558 --> 00:02:51.603 respiratory failure is what as
NOTE Confidence: 0.875713675714286
00:02:51.603 --> 00:02:54.289 well as many sleep related issues
NOTE Confidence: 0.875713675714286
00:02:54.290 --> 00:02:56.978 like treatment of sleep apnea and
NOTE Confidence: 0.875713675714286
00:02:56.978 --> 00:02:58.770 technology and sleep evaluations.
NOTE Confidence: 0.875713675714286
00:02:58.770 --> 00:03:00.474 He's had a.
NOTE Confidence: 0.875713675714286
00:03:00.474 --> 00:03:03.388 A mind boggling 185 public
NOTE Confidence: 0.875713675714286

00:03:03.388 --> 00:03:05.804 publications and holds multiple
NOTE Confidence: 0.875713675714286

00:03:05.804 --> 00:03:08.220 patents in multiple countries.
NOTE Confidence: 0.875713675714286

00:03:08.220 --> 00:03:10.128 Notably for things like
NOTE Confidence: 0.875713675714286

00:03:10.128 --> 00:03:11.559 proportional assist ventilation.
NOTE Confidence: 0.875713675714286

00:03:11.560 --> 00:03:13.684 He's also been on the editorial
NOTE Confidence: 0.875713675714286

00:03:13.684 --> 00:03:15.100 boards of many different,
NOTE Confidence: 0.875713675714286

00:03:15.100 --> 00:03:16.555 well respected publications,
NOTE Confidence: 0.875713675714286

00:03:16.555 --> 00:03:18.937 including the Blue Journal and
NOTE Confidence: 0.875713675714286

00:03:18.937 --> 00:03:20.685 currently is a distinguished
NOTE Confidence: 0.875713675714286

00:03:20.685 --> 00:03:22.433 professor and senior scholar.
NOTE Confidence: 0.875713675714286

00:03:22.440 --> 00:03:24.190 Excuse me, a distinguished professor,
NOTE Confidence: 0.875713675714286

00:03:24.190 --> 00:03:27.850 Meritous and a senior scholar at
NOTE Confidence: 0.875713675714286

00:03:27.850 --> 00:03:30.430 University of Manitoba and so.
NOTE Confidence: 0.875713675714286

00:03:30.430 --> 00:03:30.805 Uh,
NOTE Confidence: 0.875713675714286

00:03:30.805 --> 00:03:33.430 I give a warm welcome to doctor
NOTE Confidence: 0.875713675714286

00:03:33.518 --> 00:03:35.382 Eunice and very much I'm looking

NOTE Confidence: 0.875713675714286
00:03:35.382 --> 00:03:36.622 forward to this presentation today.
NOTE Confidence: 0.760814802
00:03:43.430 --> 00:03:46.640 Andre, I think you're muted. OK.
NOTE Confidence: 0.46158662
00:03:52.650 --> 00:03:53.200 Wow.
NOTE Confidence: 0.6927663
00:04:13.340 --> 00:04:14.720 Per. Like maybe it looks good.
NOTE Confidence: 0.890649371428571
00:04:15.330 --> 00:04:19.495 No, I'm just trying to get the.
NOTE Confidence: 0.890649371428571
00:04:19.500 --> 00:04:24.420 OK. Here. Can you see it now?
NOTE Confidence: 0.928476064
00:04:27.240 --> 00:04:28.670 Yes, we can see we
NOTE Confidence: 0.866285344
00:04:28.680 --> 00:04:31.420 can. Yes we we have it in the presenter mode,
NOTE Confidence: 0.866285344
00:04:31.420 --> 00:04:33.247 so so it will show your notes as well.
NOTE Confidence: 0.927065634166667
00:04:33.760 --> 00:04:36.371 Alright, so I'm supposed to let you
NOTE Confidence: 0.927065634166667
00:04:36.371 --> 00:04:39.594 know about this new thing called or
NOTE Confidence: 0.927065634166667
00:04:39.594 --> 00:04:43.004 Pi like three letter abbreviations.
NOTE Confidence: 0.927065634166667
00:04:43.010 --> 00:04:47.749 And So what this what RP is,
NOTE Confidence: 0.927065634166667
00:04:47.750 --> 00:04:50.788 is a continuous index of sleep depth,
NOTE Confidence: 0.927065634166667
00:04:50.790 --> 00:04:53.718 and the first I need to show you
NOTE Confidence: 0.927065634166667

00:04:53.718 --> 00:04:56.290 the slide that was given to me
NOTE Confidence: 0.927065634166667

00:04:56.290 --> 00:04:58.190 by Yale so that you can read it.
NOTE Confidence: 0.927065634166667

00:04:58.190 --> 00:05:00.180 So I'll give you a few seconds to read it.
NOTE Confidence: 0.684729936666667

00:05:02.430 --> 00:05:07.173 Uh, it's basically to tell you that all my.
NOTE Confidence: 0.684729936666667

00:05:07.180 --> 00:05:10.356 Uh, activities have been mitigated.
NOTE Confidence: 0.684729936666667

00:05:10.356 --> 00:05:14.069 And you can. You can ask.
NOTE Confidence: 0.684729936666667

00:05:14.070 --> 00:05:15.415 You can send a text if
NOTE Confidence: 0.684729936666667

00:05:15.415 --> 00:05:16.347 you have any questions.
NOTE Confidence: 0.684729936666667

00:05:16.350 --> 00:05:18.798 OK, so let's go.
NOTE Confidence: 0.684729936666667

00:05:18.798 --> 00:05:22.470 The ERP is basically a continuous
NOTE Confidence: 0.684729936666667

00:05:22.598 --> 00:05:28.422 index that ranges from zero to 25 to 2.5.
NOTE Confidence: 0.684729936666667

00:05:28.422 --> 00:05:32.090 Sorry it is measured every three seconds,
NOTE Confidence: 0.684729936666667

00:05:32.090 --> 00:05:34.586 so it gives a number every three seconds.
NOTE Confidence: 0.684729936666667

00:05:34.590 --> 00:05:37.278 Seeing your sleep depth is somewhere
NOTE Confidence: 0.684729936666667

00:05:37.278 --> 00:05:38.922 between zero and 2.5,
NOTE Confidence: 0.684729936666667

00:05:38.922 --> 00:05:41.258 and so you can have an idea about.

NOTE Confidence: 0.684729936666667

00:05:41.260 --> 00:05:43.388 With these numbers mean of course you can

NOTE Confidence: 0.684729936666667

00:05:43.388 --> 00:05:45.777 get any number within any range you know.

NOTE Confidence: 0.684729936666667

00:05:45.780 --> 00:05:48.743 You can have .12 point 17.28,

NOTE Confidence: 0.684729936666667

00:05:48.743 --> 00:05:51.867 but just to give you an idea about what what

NOTE Confidence: 0.684729936666667

00:05:51.867 --> 00:05:54.774 we associate with very deep sleep and so on.

NOTE Confidence: 0.684729936666667

00:05:54.780 --> 00:05:59.540 So the lowest decile is 0.25,

NOTE Confidence: 0.684729936666667

00:05:59.540 --> 00:06:03.360 which is really very deep sleep point 252.5

NOTE Confidence: 0.684729936666667

00:06:03.360 --> 00:06:07.040 is deep sleep point between zero and one.

NOTE Confidence: 0.684729936666667

00:06:07.040 --> 00:06:09.248 It's really sleep like everybody would

NOTE Confidence: 0.684729936666667

00:06:09.248 --> 00:06:12.060 agree is sleep, but it is graded.

NOTE Confidence: 0.684729936666667

00:06:12.060 --> 00:06:15.705 From zero to one and then there is that

NOTE Confidence: 0.684729936666667

00:06:15.705 --> 00:06:18.081 middle section between one and 1.75,

NOTE Confidence: 0.684729936666667

00:06:18.081 --> 00:06:20.236 which is transitional sleep that

NOTE Confidence: 0.684729936666667

00:06:20.236 --> 00:06:24.073 you have a mix in the app of between

NOTE Confidence: 0.684729936666667

00:06:24.073 --> 00:06:26.103 sleep and and wake patterns.

NOTE Confidence: 0.684729936666667

00:06:26.110 --> 00:06:30.310 But generally the text will call it sleep.
NOTE Confidence: 0.684729936666667

00:06:30.310 --> 00:06:33.565 1.7 to two is very drowsy awake.
NOTE Confidence: 0.684729936666667

00:06:33.570 --> 00:06:35.754 2 to 2.5 is drowsie week and
NOTE Confidence: 0.684729936666667

00:06:35.754 --> 00:06:37.869 this is the important one.
NOTE Confidence: 0.684729936666667

00:06:37.870 --> 00:06:40.885 Fully week is the highest
NOTE Confidence: 0.684729936666667

00:06:40.885 --> 00:06:43.297 decile of this range.
NOTE Confidence: 0.684729936666667

00:06:43.300 --> 00:06:46.675 So why do we need a continuous measure of?
NOTE Confidence: 0.684729936666667

00:06:46.680 --> 00:06:48.660 Why do we need a continuous
NOTE Confidence: 0.684729936666667

00:06:48.660 --> 00:06:50.490 new index of sleep depth?
NOTE Confidence: 0.684729936666667

00:06:50.490 --> 00:06:51.118 Three reasons.
NOTE Confidence: 0.684729936666667

00:06:51.118 --> 00:06:51.432 First,
NOTE Confidence: 0.684729936666667

00:06:51.432 --> 00:06:54.582 there is a lot of a lot of work is
NOTE Confidence: 0.684729936666667

00:06:54.582 --> 00:06:57.320 being done to show that there are
NOTE Confidence: 0.684729936666667

00:06:57.320 --> 00:06:59.463 negative consequences to health in
NOTE Confidence: 0.684729936666667

00:06:59.463 --> 00:07:02.847 every in nearly every organ in the body
NOTE Confidence: 0.684729936666667

00:07:02.850 --> 00:07:06.665 and risk factors to many common disorders.

NOTE Confidence: 0.684729936666667

00:07:06.670 --> 00:07:07.253 Uhm,

NOTE Confidence: 0.684729936666667

00:07:07.253 --> 00:07:10.168 the impact of sleep duration,

NOTE Confidence: 0.684729936666667

00:07:10.170 --> 00:07:13.258 which is total sleep time and timing of

NOTE Confidence: 0.684729936666667

00:07:13.258 --> 00:07:15.827 sleep relative to the circadian rhythm.

NOTE Confidence: 0.684729936666667

00:07:15.830 --> 00:07:17.756 The impact of these two factors

NOTE Confidence: 0.684729936666667

00:07:17.756 --> 00:07:19.612 on health have been studied

NOTE Confidence: 0.684729936666667

00:07:19.612 --> 00:07:21.628 extensively and well documented,

NOTE Confidence: 0.684729936666667

00:07:21.630 --> 00:07:24.276 but there is very little information about

NOTE Confidence: 0.684729936666667

00:07:24.276 --> 00:07:26.967 the impact of sleep depth on health.

NOTE Confidence: 0.684729936666667

00:07:26.970 --> 00:07:27.921 And of course,

NOTE Confidence: 0.684729936666667

00:07:27.921 --> 00:07:30.580 you can imagine that we want to know

NOTE Confidence: 0.684729936666667

00:07:30.580 --> 00:07:32.770 whether if your sleep is deeper,

NOTE Confidence: 0.684729936666667

00:07:32.770 --> 00:07:34.002 your health is better,

NOTE Confidence: 0.684729936666667

00:07:34.002 --> 00:07:36.180 but there is no information about this.

NOTE Confidence: 0.83211323

00:07:38.490 --> 00:07:41.120 And the third reason why we need an index is

NOTE Confidence: 0.83211323

00:07:41.185 --> 00:07:43.880 that the conventional metrics of sleep depth,
NOTE Confidence: 0.83211323

00:07:43.880 --> 00:07:46.960 which are typically sleep efficiency,
NOTE Confidence: 0.83211323

00:07:46.960 --> 00:07:50.096 percent of time in any one and three,
NOTE Confidence: 0.83211323

00:07:50.100 --> 00:07:53.138 and the arousal awakening index this for
NOTE Confidence: 0.83211323

00:07:53.138 --> 00:07:56.314 indices which were typically used in in the
NOTE Confidence: 0.83211323

00:07:56.314 --> 00:07:59.369 clinic as indices of how deeply sleep is,
NOTE Confidence: 0.83211323

00:07:59.370 --> 00:08:01.995 more N3 means more deep sleep more,
NOTE Confidence: 0.83211323

00:08:02.000 --> 00:08:05.330 and one means more light sleep and so on.
NOTE Confidence: 0.83211323

00:08:05.330 --> 00:08:08.458 These are seriously flawed.
NOTE Confidence: 0.83211323

00:08:08.460 --> 00:08:12.318 And the. The next couple of
NOTE Confidence: 0.83211323

00:08:12.318 --> 00:08:16.499 slides will show you why I mean,
NOTE Confidence: 0.83211323

00:08:16.500 --> 00:08:18.936 because it is important that you
NOTE Confidence: 0.83211323

00:08:18.936 --> 00:08:21.799 know that the indices we are using
NOTE Confidence: 0.83211323

00:08:21.799 --> 00:08:24.109 now are not really that reliable.
NOTE Confidence: 0.83211323

00:08:24.110 --> 00:08:25.703 The first thing,
NOTE Confidence: 0.83211323

00:08:25.703 --> 00:08:29.420 sleep efficiency is really gives you the

NOTE Confidence: 0.83211323

00:08:29.513 --> 00:08:33.233 percent of time you are awake or asleep.

NOTE Confidence: 0.83211323

00:08:33.240 --> 00:08:35.442 But it doesn't tell you anything

NOTE Confidence: 0.83211323

00:08:35.442 --> 00:08:38.030 about the quality of the week state.

NOTE Confidence: 0.83211323

00:08:38.030 --> 00:08:40.634 The AG and epochs that are typically

NOTE Confidence: 0.83211323

00:08:40.634 --> 00:08:43.488 scored a week can range from patterns

NOTE Confidence: 0.83211323

00:08:43.488 --> 00:08:45.984 that are very similar to anyone,

NOTE Confidence: 0.83211323

00:08:45.990 --> 00:08:47.926 including periods of microsleep

NOTE Confidence: 0.83211323

00:08:47.926 --> 00:08:50.346 to patterns of full wakefulness.

NOTE Confidence: 0.83211323

00:08:50.350 --> 00:08:53.843 And here is a slide we published

NOTE Confidence: 0.83211323

00:08:53.843 --> 00:08:57.548 recently that shows you. And C3 and two.

NOTE Confidence: 0.83211323

00:08:57.548 --> 00:09:01.400 An airport that we would call fully awake,

NOTE Confidence: 0.83211323

00:09:01.400 --> 00:09:03.656 and then you start getting a little bit

NOTE Confidence: 0.83211323

00:09:03.656 --> 00:09:05.831 of theater in the second one and more

NOTE Confidence: 0.83211323

00:09:05.831 --> 00:09:07.851 theater in this and then in the last

NOTE Confidence: 0.83211323

00:09:07.851 --> 00:09:10.182 one you can see a period of microsleep.

NOTE Confidence: 0.83211323

00:09:10.182 --> 00:09:13.008 But all of these are scored
NOTE Confidence: 0.83211323

00:09:13.008 --> 00:09:14.610 awake according to RNC,
NOTE Confidence: 0.83211323

00:09:14.610 --> 00:09:16.500 because even when you have
NOTE Confidence: 0.83211323

00:09:16.500 --> 00:09:18.012 micro skip like that,
NOTE Confidence: 0.83211323

00:09:18.020 --> 00:09:21.177 it doesn't meet the 15 second criteria.
NOTE Confidence: 0.83211323

00:09:21.180 --> 00:09:23.035 And I just also want to make
NOTE Confidence: 0.83211323

00:09:23.035 --> 00:09:24.939 you aware of this phenomenon,
NOTE Confidence: 0.83211323

00:09:24.940 --> 00:09:27.820 which which is very important clinically.
NOTE Confidence: 0.83211323

00:09:27.820 --> 00:09:30.636 This again is an epic of full wakefulness
NOTE Confidence: 0.83211323

00:09:30.636 --> 00:09:33.599 or sorry I I should have shown you this.
NOTE Confidence: 0.83211323

00:09:33.600 --> 00:09:36.176 So the RP here the average for the
NOTE Confidence: 0.83211323

00:09:36.176 --> 00:09:38.911 10 numbers because we have 10 three
NOTE Confidence: 0.83211323

00:09:38.911 --> 00:09:42.320 second efforts here, so 10 or P values.
NOTE Confidence: 0.83211323

00:09:42.320 --> 00:09:45.200 The average here is 2.5 which is pretty
NOTE Confidence: 0.83211323

00:09:45.200 --> 00:09:47.825 close to the maximum range for RP.
NOTE Confidence: 0.83211323

00:09:47.825 --> 00:09:50.652 And then as the patient gets a little

NOTE Confidence: 0.83211323

00:09:50.652 --> 00:09:53.064 bit more of the sleep pattern.

NOTE Confidence: 0.83211323

00:09:53.070 --> 00:09:56.590 The RP goes down and here is still

NOTE Confidence: 0.83211323

00:09:56.590 --> 00:09:58.198 1.69 because because,

NOTE Confidence: 0.83211323

00:09:58.198 --> 00:10:03.220 but it is very close to being asleep now.

NOTE Confidence: 0.83211323

00:10:03.220 --> 00:10:06.346 This this this this example here

NOTE Confidence: 0.83211323

00:10:06.346 --> 00:10:08.430 just illustrates something that

NOTE Confidence: 0.83211323

00:10:08.521 --> 00:10:10.069 we see commonly in.

NOTE Confidence: 0.83211323

00:10:10.070 --> 00:10:13.676 You know, in severe OSA patients.

NOTE Confidence: 0.83211323

00:10:13.680 --> 00:10:14.956 And can be misleading.

NOTE Confidence: 0.83211323

00:10:14.956 --> 00:10:18.065 So so this is the patient in a full

NOTE Confidence: 0.83211323

00:10:18.065 --> 00:10:19.935 wakefulness just before lights out.

NOTE Confidence: 0.83211323

00:10:19.940 --> 00:10:23.630 And then when he when he gets into the sleep,

NOTE Confidence: 0.83211323

00:10:23.630 --> 00:10:26.590 you can see that in the top one DRP is

NOTE Confidence: 0.83211323

00:10:26.671 --> 00:10:30.580 pretty close to 2.5 in every three seconds,

NOTE Confidence: 0.83211323

00:10:30.580 --> 00:10:33.680 and the average is 2.48.

NOTE Confidence: 0.83211323

00:10:33.680 --> 00:10:35.934 But in this one the same patient,
NOTE Confidence: 0.83211323

00:10:35.940 --> 00:10:37.560 now he's going to sleep,
NOTE Confidence: 0.83211323

00:10:37.560 --> 00:10:39.570 but and he still called awake.
NOTE Confidence: 0.83211323

00:10:39.570 --> 00:10:41.481 But you can see that in this
NOTE Confidence: 0.83211323

00:10:41.481 --> 00:10:43.020 airport these are two epochs.
NOTE Confidence: 0.83211323

00:10:43.020 --> 00:10:44.396 This is 30 seconds.
NOTE Confidence: 0.83211323

00:10:44.396 --> 00:10:46.460 And this is another 30 seconds
NOTE Confidence: 0.83211323

00:10:46.530 --> 00:10:48.318 and you can see that here.
NOTE Confidence: 0.83211323

00:10:48.320 --> 00:10:49.628 He was wide awake.
NOTE Confidence: 0.83211323

00:10:49.628 --> 00:10:51.590 And then he starts dozing off.
NOTE Confidence: 0.83211323

00:10:51.590 --> 00:10:53.718 You see the OR P coming down.
NOTE Confidence: 0.83211323

00:10:53.720 --> 00:10:56.898 He gets an apnea, wakes him up.
NOTE Confidence: 0.83211323

00:10:56.900 --> 00:10:58.780 Or P goes up again.
NOTE Confidence: 0.83211323

00:10:58.780 --> 00:11:00.884 Then he tries to go to sleep again.
NOTE Confidence: 0.724087445714286

00:11:00.890 --> 00:11:02.808 You see the OR P coming down,
NOTE Confidence: 0.724087445714286

00:11:02.810 --> 00:11:05.168 he gets another apnea and this is what what

NOTE Confidence: 0.724087445714286
00:11:05.168 --> 00:11:07.629 your patients are doing in the waiting room.
NOTE Confidence: 0.724087445714286
00:11:07.630 --> 00:11:09.250 While you're waiting for you.
NOTE Confidence: 0.724087445714286
00:11:09.250 --> 00:11:11.210 Is there a week they are awake,
NOTE Confidence: 0.724087445714286
00:11:11.210 --> 00:11:13.670 but they're really getting recurrent apnea,
NOTE Confidence: 0.724087445714286
00:11:13.670 --> 00:11:15.524 so I think you appreciate that
NOTE Confidence: 0.724087445714286
00:11:15.524 --> 00:11:17.962 there is a big difference between an
NOTE Confidence: 0.724087445714286
00:11:17.962 --> 00:11:20.601 awake epic like like the top one,
NOTE Confidence: 0.724087445714286
00:11:20.610 --> 00:11:23.445 and we kept looks like the bottom one here.
NOTE Confidence: 0.724087445714286
00:11:23.450 --> 00:11:24.975 Here the patient really has
NOTE Confidence: 0.724087445714286
00:11:24.975 --> 00:11:26.940 no sleep drive and he can't.
NOTE Confidence: 0.724087445714286
00:11:26.940 --> 00:11:28.674 Told us people he's not even
NOTE Confidence: 0.724087445714286
00:11:28.674 --> 00:11:29.830 trying to fall asleep,
NOTE Confidence: 0.724087445714286
00:11:29.830 --> 00:11:32.467 but in this in the lower one you you
NOTE Confidence: 0.724087445714286
00:11:32.467 --> 00:11:34.267 appreciate that the patients really
NOTE Confidence: 0.724087445714286
00:11:34.267 --> 00:11:36.433 very drowsy and wanting to sleep.
NOTE Confidence: 0.724087445714286

00:11:36.440 --> 00:11:39.800 But every time he falls off a bit,

NOTE Confidence: 0.724087445714286

00:11:39.800 --> 00:11:41.930 as evidenced by the RP,

NOTE Confidence: 0.724087445714286

00:11:41.930 --> 00:11:43.712 he gets an apnea which prevents

NOTE Confidence: 0.724087445714286

00:11:43.712 --> 00:11:45.599 him from going into deep sleep.

NOTE Confidence: 0.724087445714286

00:11:45.600 --> 00:11:48.132 So this one would score pretty

NOTE Confidence: 0.724087445714286

00:11:48.132 --> 00:11:49.820 high on your P,

NOTE Confidence: 0.724087445714286

00:11:49.820 --> 00:11:51.136 which means that sleep

NOTE Confidence: 0.724087445714286

00:11:51.136 --> 00:11:53.110 pressure is not high at all.

NOTE Confidence: 0.724087445714286

00:11:53.110 --> 00:11:54.349 It's very low,

NOTE Confidence: 0.724087445714286

00:11:54.349 --> 00:11:56.001 whereas these ones while

NOTE Confidence: 0.724087445714286

00:11:56.001 --> 00:11:57.690 also called the week.

NOTE Confidence: 0.724087445714286

00:11:57.690 --> 00:11:59.865 Would score quite low on

NOTE Confidence: 0.724087445714286

00:11:59.865 --> 00:12:02.340 the on the awake or P,

NOTE Confidence: 0.724087445714286

00:12:02.340 --> 00:12:05.890 which goes down to about 1.5

NOTE Confidence: 0.724087445714286

00:12:05.890 --> 00:12:08.802 minimum and so so that what means

NOTE Confidence: 0.724087445714286

00:12:08.802 --> 00:12:10.956 the patient just can't sleep

NOTE Confidence: 0.724087445714286
00:12:10.956 --> 00:12:13.805 because he's got a lot of drive.
NOTE Confidence: 0.724087445714286
00:12:13.810 --> 00:12:16.195 But this one says he doesn't have any drive,
NOTE Confidence: 0.724087445714286
00:12:16.200 --> 00:12:19.196 and these two obviously are very difficult.
NOTE Confidence: 0.724087445714286
00:12:19.200 --> 00:12:22.236 Different conditions in the same patient,
NOTE Confidence: 0.724087445714286
00:12:22.240 --> 00:12:24.592 and when we just use the
NOTE Confidence: 0.724087445714286
00:12:24.592 --> 00:12:25.376 conventional criteria,
NOTE Confidence: 0.724087445714286
00:12:25.380 --> 00:12:27.600 we cannot distinguish between these.
NOTE Confidence: 0.724087445714286
00:12:27.600 --> 00:12:30.895 But the RP will give you the OR P value in
NOTE Confidence: 0.724087445714286
00:12:30.895 --> 00:12:33.647 the weekend box and the lower they are,
NOTE Confidence: 0.724087445714286
00:12:33.650 --> 00:12:35.666 the more drowsy the patient is
NOTE Confidence: 0.724087445714286
00:12:35.666 --> 00:12:37.969 and the more there is something
NOTE Confidence: 0.724087445714286
00:12:37.969 --> 00:12:40.174 keeping him from falling asleep.
NOTE Confidence: 0.724087445714286
00:12:40.180 --> 00:12:43.940 The second reason the conventional.
NOTE Confidence: 0.724087445714286
00:12:43.940 --> 00:12:46.955 Criteria or fraud is that the
NOTE Confidence: 0.724087445714286
00:12:46.955 --> 00:12:49.280 ASM amazingly requires that you
NOTE Confidence: 0.724087445714286

00:12:49.280 --> 00:12:52.545 changed non REM sleep to stage one

NOTE Confidence: 0.724087445714286

00:12:52.545 --> 00:12:54.740 every time there's an arousal,

NOTE Confidence: 0.724087445714286

00:12:54.740 --> 00:12:56.642 so you still staying in one

NOTE Confidence: 0.724087445714286

00:12:56.642 --> 00:12:58.560 until there is a spindle,

NOTE Confidence: 0.724087445714286

00:12:58.560 --> 00:13:00.498 but they spend their can come

NOTE Confidence: 0.724087445714286

00:13:00.498 --> 00:13:03.154 in the next 5 seconds or it may

NOTE Confidence: 0.724087445714286

00:13:03.154 --> 00:13:04.902 not come for 545 apples,

NOTE Confidence: 0.724087445714286

00:13:04.902 --> 00:13:07.639 so every time there is an arousal

NOTE Confidence: 0.724087445714286

00:13:07.639 --> 00:13:09.855 you're adding and adding to end

NOTE Confidence: 0.724087445714286

00:13:09.855 --> 00:13:12.042 one pending the appearance of

NOTE Confidence: 0.724087445714286

00:13:12.042 --> 00:13:15.044 spindles and so so and one really.

NOTE Confidence: 0.724087445714286

00:13:15.044 --> 00:13:17.074 Doesn't add anything over over

NOTE Confidence: 0.724087445714286

00:13:17.074 --> 00:13:18.629 the arousal index.

NOTE Confidence: 0.724087445714286

00:13:18.630 --> 00:13:20.710 The more arousals you have

NOTE Confidence: 0.724087445714286

00:13:20.710 --> 00:13:22.374 with the current criteria,

NOTE Confidence: 0.724087445714286

00:13:22.380 --> 00:13:24.704 the the more and one will be,

NOTE Confidence: 0.724087445714286
00:13:24.710 --> 00:13:26.846 so that is a that is a problem.
NOTE Confidence: 0.724087445714286
00:13:26.850 --> 00:13:29.650 If you want to use N1 as
NOTE Confidence: 0.724087445714286
00:13:29.650 --> 00:13:32.299 an index of light sleep.
NOTE Confidence: 0.724087445714286
00:13:32.300 --> 00:13:34.292 The ability of technologies
NOTE Confidence: 0.724087445714286
00:13:34.292 --> 00:13:36.782 to estimate total duration of
NOTE Confidence: 0.724087445714286
00:13:36.782 --> 00:13:38.945 qualifying Delta DSM says the Delta
NOTE Confidence: 0.724087445714286
00:13:38.945 --> 00:13:41.186 Wave has to be 75 microvolt has
NOTE Confidence: 0.724087445714286
00:13:41.186 --> 00:13:43.440 to be between .5 and two second,
NOTE Confidence: 0.724087445714286
00:13:43.440 --> 00:13:45.840 and so on, and the text are supposed
NOTE Confidence: 0.724087445714286
00:13:45.840 --> 00:13:47.259 to identify every delta.
NOTE Confidence: 0.724087445714286
00:13:47.260 --> 00:13:47.892 Even then,
NOTE Confidence: 0.724087445714286
00:13:47.892 --> 00:13:50.420 add up their durations to see if they
NOTE Confidence: 0.724087445714286
00:13:50.493 --> 00:13:52.997 add up to six seconds before they get.
NOTE Confidence: 0.724087445714286
00:13:53.000 --> 00:13:55.003 They call it and three, well,
NOTE Confidence: 0.724087445714286
00:13:55.003 --> 00:13:57.420 I mean which which tech is going to do this?
NOTE Confidence: 0.724087445714286

00:13:57.420 --> 00:13:59.292 This is a study we published
NOTE Confidence: 0.724087445714286

00:13:59.292 --> 00:14:02.582 a few years ago that shows.
NOTE Confidence: 0.724087445714286

00:14:02.582 --> 00:14:03.603 Uh,
NOTE Confidence: 0.724087445714286

00:14:03.603 --> 00:14:06.666 seventy 7070 PSGS.
NOTE Confidence: 0.724087445714286

00:14:06.670 --> 00:14:08.842 Each one was scored by 10
NOTE Confidence: 0.724087445714286

00:14:08.842 --> 00:14:10.290 technicians and the number
NOTE Confidence: 0.792688344666667

00:14:10.369 --> 00:14:12.691 on the X here is the is the average
NOTE Confidence: 0.792688344666667

00:14:12.691 --> 00:14:15.072 N three times by the 10 technicians
NOTE Confidence: 0.792688344666667

00:14:15.072 --> 00:14:17.655 which we use as the gold standard.
NOTE Confidence: 0.792688344666667

00:14:17.655 --> 00:14:20.085 But you can see at any
NOTE Confidence: 0.792688344666667

00:14:20.085 --> 00:14:21.900 average like here is 11.
NOTE Confidence: 0.792688344666667

00:14:21.900 --> 00:14:23.985 One technician called 01 technician
NOTE Confidence: 0.792688344666667

00:14:23.985 --> 00:14:27.185 called 30 and and it's all over the
NOTE Confidence: 0.792688344666667

00:14:27.185 --> 00:14:29.600 place so that it's really like like
NOTE Confidence: 0.792688344666667

00:14:29.680 --> 00:14:32.151 tossing a coin to figure out which
NOTE Confidence: 0.792688344666667

00:14:32.151 --> 00:14:34.623 it all depends on which technician,

NOTE Confidence: 0.792688344666667

00:14:34.623 --> 00:14:36.978 Technologist has scored the file.

NOTE Confidence: 0.792688344666667

00:14:36.980 --> 00:14:39.192 So that ends three as an index

NOTE Confidence: 0.792688344666667

00:14:39.192 --> 00:14:41.192 of deep sleep is not really

NOTE Confidence: 0.792688344666667

00:14:41.192 --> 00:14:43.460 that reliable if you are in N3,

NOTE Confidence: 0.792688344666667

00:14:43.460 --> 00:14:45.116 you know you're in deep sleep,

NOTE Confidence: 0.792688344666667

00:14:45.120 --> 00:14:47.176 but you can't use that as an index.

NOTE Confidence: 0.792688344666667

00:14:47.180 --> 00:14:47.808 You can.

NOTE Confidence: 0.792688344666667

00:14:47.808 --> 00:14:50.320 You can be in deep sleep without having

NOTE Confidence: 0.792688344666667

00:14:50.389 --> 00:14:52.549 the required delta waves because.

NOTE Confidence: 0.792688344666667

00:14:52.550 --> 00:14:55.110 The easiest small or whatever,

NOTE Confidence: 0.792688344666667

00:14:55.110 --> 00:14:59.170 so so that takes care of N3.

NOTE Confidence: 0.792688344666667

00:14:59.170 --> 00:15:01.546 The other very important thing is

NOTE Confidence: 0.792688344666667

00:15:01.546 --> 00:15:04.853 that N1 and N3 usually occupies more

NOTE Confidence: 0.792688344666667

00:15:04.853 --> 00:15:07.917 fractions of the recording time and

NOTE Confidence: 0.792688344666667

00:15:07.917 --> 00:15:10.206 that represent the extremes of sleep depth.

NOTE Confidence: 0.792688344666667

00:15:10.210 --> 00:15:12.570 But most of the time we spend in
NOTE Confidence: 0.792688344666667

00:15:12.570 --> 00:15:15.284 end two and most of this range of
NOTE Confidence: 0.792688344666667

00:15:15.284 --> 00:15:17.687 sleep depth happens in end two as
NOTE Confidence: 0.792688344666667

00:15:17.687 --> 00:15:19.801 you go from one to deep sleep,
NOTE Confidence: 0.792688344666667

00:15:19.810 --> 00:15:21.952 you go through all the stage
NOTE Confidence: 0.792688344666667

00:15:21.952 --> 00:15:24.220 all the depth when you reach.
NOTE Confidence: 0.792688344666667

00:15:24.220 --> 00:15:26.068 And three are in very deep sleep,
NOTE Confidence: 0.792688344666667

00:15:26.070 --> 00:15:27.820 but you don't really know
NOTE Confidence: 0.792688344666667

00:15:27.820 --> 00:15:29.570 what's happening in end two.
NOTE Confidence: 0.792688344666667

00:15:29.570 --> 00:15:32.069 And here are five epochs in end.
NOTE Confidence: 0.792688344666667

00:15:32.070 --> 00:15:34.614 Two these top five year and you see
NOTE Confidence: 0.792688344666667

00:15:34.614 --> 00:15:37.208 this one is pretty close to anyone.
NOTE Confidence: 0.792688344666667

00:15:37.210 --> 00:15:39.046 But there is a spindle here,
NOTE Confidence: 0.792688344666667

00:15:39.050 --> 00:15:40.098 but then it gets.
NOTE Confidence: 0.906552102

00:15:45.030 --> 00:15:47.380 You cannot see the pointer.
NOTE Confidence: 0.906552102

00:15:47.380 --> 00:15:49.175 Oh, I see, but they cannot

NOTE Confidence: 0.906552102

00:15:49.175 --> 00:15:50.660 see this. Yeah, we can.

NOTE Confidence: 0.906552102

00:15:50.660 --> 00:15:54.800 OK can you see my pointer now?

NOTE Confidence: 0.906552102

00:15:54.800 --> 00:15:56.060 Can you see my pointer?

NOTE Confidence: 0.71334472

00:15:56.110 --> 00:15:57.578 Yes, yes, maybe yeah.

NOTE Confidence: 0.9296993333333333

00:15:58.400 --> 00:16:02.630 OK, so you can see that the top one.

NOTE Confidence: 0.9296993333333333

00:16:02.630 --> 00:16:05.346 Is it's pretty much like anyone except

NOTE Confidence: 0.9296993333333333

00:16:05.346 --> 00:16:08.516 for a spender here and then it gets you

NOTE Confidence: 0.9296993333333333

00:16:08.516 --> 00:16:11.669 got more and more theater and delta waves,

NOTE Confidence: 0.9296993333333333

00:16:11.670 --> 00:16:14.190 but they don't make the end 3 criterion

NOTE Confidence: 0.9296993333333333

00:16:14.190 --> 00:16:16.587 because they don't add up to six seconds,

NOTE Confidence: 0.9296993333333333

00:16:16.590 --> 00:16:20.000 so you can see that the RP is going from 1.8

NOTE Confidence: 0.9296993333333333

00:16:20.000 --> 00:16:24.310 all the way down to .6 with in stage two.

NOTE Confidence: 0.9296993333333333

00:16:24.310 --> 00:16:26.374 And you know once you get into stage

NOTE Confidence: 0.9296993333333333

00:16:26.374 --> 00:16:28.507 three or already in very deep sleep,

NOTE Confidence: 0.9296993333333333

00:16:28.510 --> 00:16:31.102 but you don't really know when when the

NOTE Confidence: 0.9296993333333333

00:16:31.102 --> 00:16:35.260 patient was an end to how deep it is. Was.
NOTE Confidence: 0.9296993333333333

00:16:35.260 --> 00:16:37.816 The other reason is that conventional
NOTE Confidence: 0.9296993333333333

00:16:37.816 --> 00:16:41.189 metrics of sleep debt there is many of them.
NOTE Confidence: 0.9296993333333333

00:16:41.190 --> 00:16:42.620 There are several of them,
NOTE Confidence: 0.9296993333333333

00:16:42.620 --> 00:16:45.308 and sometimes when you do an intervention
NOTE Confidence: 0.9296993333333333

00:16:45.308 --> 00:16:47.551 like taking a drug or putting
NOTE Confidence: 0.9296993333333333

00:16:47.551 --> 00:16:48.907 a patient on CPAP.
NOTE Confidence: 0.9296993333333333

00:16:48.910 --> 00:16:51.014 One of them goes in the right direction.
NOTE Confidence: 0.9296993333333333

00:16:51.020 --> 00:16:53.148 Other ones go in the wrong direction.
NOTE Confidence: 0.9296993333333333

00:16:53.150 --> 00:16:55.022 So so for example,
NOTE Confidence: 0.9296993333333333

00:16:55.022 --> 00:16:58.460 arousal index may get better with C PAP,
NOTE Confidence: 0.9296993333333333

00:16:58.460 --> 00:16:59.750 but N 3 is lower.
NOTE Confidence: 0.9296993333333333

00:16:59.750 --> 00:17:02.116 So is it sleep better or worse?
NOTE Confidence: 0.9296993333333333

00:17:02.120 --> 00:17:03.520 We don't really know,
NOTE Confidence: 0.9296993333333333

00:17:03.520 --> 00:17:06.977 whereas lower P is a single metric and you
NOTE Confidence: 0.9296993333333333

00:17:06.977 --> 00:17:09.973 know there is no problem with interpretation.

NOTE Confidence: 0.9296993333333333
00:17:09.980 --> 00:17:10.319 Finally,
NOTE Confidence: 0.9296993333333333
00:17:10.319 --> 00:17:12.353 there are other index which is
NOTE Confidence: 0.9296993333333333
00:17:12.353 --> 00:17:14.647 often used as a measure of sleep.
NOTE Confidence: 0.9296993333333333
00:17:14.650 --> 00:17:18.000 Continuity is simply an account
NOTE Confidence: 0.9296993333333333
00:17:18.000 --> 00:17:20.670 at count of sporadic events.
NOTE Confidence: 0.9296993333333333
00:17:20.670 --> 00:17:22.820 That does not consider their
NOTE Confidence: 0.9296993333333333
00:17:22.820 --> 00:17:24.110 duration or intensity,
NOTE Confidence: 0.9296993333333333
00:17:24.110 --> 00:17:26.028 and we know that the duration can
NOTE Confidence: 0.9296993333333333
00:17:26.028 --> 00:17:28.681 be up to 15 seconds or down to
NOTE Confidence: 0.9296993333333333
00:17:28.681 --> 00:17:30.441 three seconds and the intensity.
NOTE Confidence: 0.9296993333333333
00:17:30.450 --> 00:17:31.710 We have papers Ali,
NOTE Confidence: 0.9296993333333333
00:17:31.710 --> 00:17:34.475 who as he is is here has published
NOTE Confidence: 0.9296993333333333
00:17:34.475 --> 00:17:37.627 a paper about how arousers can be of
NOTE Confidence: 0.9296993333333333
00:17:37.714 --> 00:17:40.909 different intensities and how these
NOTE Confidence: 0.9296993333333333
00:17:40.909 --> 00:17:44.104 intensities affect the physiologic responses.
NOTE Confidence: 0.9296993333333333

00:17:44.110 --> 00:17:46.189 So so I hope I've convinced you
NOTE Confidence: 0.9296993333333333

00:17:46.189 --> 00:17:48.539 not to look anymore about the sleep
NOTE Confidence: 0.9296993333333333

00:17:48.539 --> 00:17:51.170 stages that you get on the report.
NOTE Confidence: 0.9296993333333333

00:17:51.170 --> 00:17:52.486 I know it's difficult,
NOTE Confidence: 0.9296993333333333

00:17:52.486 --> 00:17:54.460 but this is this is true.
NOTE Confidence: 0.9296993333333333

00:17:54.460 --> 00:17:56.888 How is it measured?
NOTE Confidence: 0.9296993333333333

00:17:56.890 --> 00:18:00.110 So it's the it's measure is it's
NOTE Confidence: 0.9296993333333333

00:18:00.110 --> 00:18:02.730 describing great detail in this paper,
NOTE Confidence: 0.9296993333333333

00:18:02.730 --> 00:18:04.431 and so I don't really want to
NOTE Confidence: 0.9296993333333333

00:18:04.431 --> 00:18:06.269 take much time going through this.
NOTE Confidence: 0.9296993333333333

00:18:06.270 --> 00:18:08.750 If you can read it.
NOTE Confidence: 0.9296993333333333

00:18:08.750 --> 00:18:10.927 There is a brief version version which
NOTE Confidence: 0.9296993333333333

00:18:10.927 --> 00:18:13.148 I'm going to describe to you now,
NOTE Confidence: 0.9296993333333333

00:18:13.150 --> 00:18:16.006 so you start with a 3 second airport
NOTE Confidence: 0.9296993333333333

00:18:16.006 --> 00:18:19.250 and you do all kinds of manipulations.
NOTE Confidence: 0.9296993333333333

00:18:19.250 --> 00:18:23.018 You end up giving it a four digit

NOTE Confidence: 0.9296993333333333
00:18:23.018 --> 00:18:23.870 number 8410.
NOTE Confidence: 0.9296993333333333
00:18:23.870 --> 00:18:26.150 The eight is the relative power,
NOTE Confidence: 0.9296993333333333
00:18:26.150 --> 00:18:27.722 eight out of nine,
NOTE Confidence: 0.9296993333333333
00:18:27.722 --> 00:18:30.080 the eight is the relative power
NOTE Confidence: 0.9296993333333333
00:18:30.168 --> 00:18:31.350 of delta waves.
NOTE Confidence: 0.9296993333333333
00:18:31.350 --> 00:18:33.786 The four is the relative power
NOTE Confidence: 0.9296993333333333
00:18:33.786 --> 00:18:35.004 of Theta waves.
NOTE Confidence: 0.9296993333333333
00:18:35.010 --> 00:18:39.537 The one is the relative power of alpha waves.
NOTE Confidence: 0.9296993333333333
00:18:39.540 --> 00:18:41.395 And the zero is the relative power
NOTE Confidence: 0.9296993333333333
00:18:41.395 --> 00:18:43.258 of beta so that that number.
NOTE Confidence: 0.9296993333333333
00:18:43.260 --> 00:18:44.538 Actually, if you think about it,
NOTE Confidence: 0.9296993333333333
00:18:44.540 --> 00:18:47.634 gives you a very good idea about
NOTE Confidence: 0.9296993333333333
00:18:47.634 --> 00:18:49.750 the shape of the EG.
NOTE Confidence: 0.9296993333333333
00:18:49.750 --> 00:18:51.703 The trick is how to get from
NOTE Confidence: 0.9296993333333333
00:18:51.703 --> 00:18:53.370 this pattern to this number.
NOTE Confidence: 0.9296993333333333

00:18:53.370 --> 00:18:55.428 But once we get to this number
NOTE Confidence: 0.9296993333333333

00:18:55.428 --> 00:18:57.777 then there is a look up table says.
NOTE Confidence: 0.9296993333333333

00:18:57.780 --> 00:19:00.688 How often does this number happen
NOTE Confidence: 0.9296993333333333

00:19:00.688 --> 00:19:03.556 in epochs that are scored awake
NOTE Confidence: 0.9296993333333333

00:19:03.556 --> 00:19:04.990 or during arousals?
NOTE Confidence: 0.9296993333333333

00:19:04.990 --> 00:19:07.555 So it gives us a percent of zero to
NOTE Confidence: 0.8061934225

00:19:07.560 --> 00:19:10.423 100%. So if the if the number
NOTE Confidence: 0.8061934225

00:19:10.423 --> 00:19:12.490 for example is one way.
NOTE Confidence: 0.8061934225

00:19:12.490 --> 00:19:14.681 It will say the probability of it
NOTE Confidence: 0.8061934225

00:19:14.681 --> 00:19:16.990 happening in a week epochs is zero,
NOTE Confidence: 0.8061934225

00:19:16.990 --> 00:19:19.270 or it could be 100%.
NOTE Confidence: 0.8061934225

00:19:19.270 --> 00:19:21.370 And then just to be a
NOTE Confidence: 0.8061934225

00:19:21.370 --> 00:19:22.420 difficult and different,
NOTE Confidence: 0.8061934225

00:19:22.420 --> 00:19:24.184 we don't want to be so ordinary.
NOTE Confidence: 0.8061934225

00:19:24.190 --> 00:19:27.106 We divide this zero to 100
NOTE Confidence: 0.8061934225

00:19:27.106 --> 00:19:30.495 probability by 40 to make it zero to 2.5.

NOTE Confidence: 0.8061934225

00:19:30.495 --> 00:19:32.490 But it's just the OR P is.

NOTE Confidence: 0.8061934225

00:19:32.490 --> 00:19:35.220 Basically it's basically the the

NOTE Confidence: 0.8061934225

00:19:35.220 --> 00:19:38.650 probability divided by 4G that direct.

NOTE Confidence: 0.8061934225

00:19:38.650 --> 00:19:41.026 So this is the short version.

NOTE Confidence: 0.8061934225

00:19:41.030 --> 00:19:42.350 I have the wrong version,

NOTE Confidence: 0.8061934225

00:19:42.350 --> 00:19:44.942 but I'm not going to go through it

NOTE Confidence: 0.8061934225

00:19:44.942 --> 00:19:47.681 if there is time at the end then

NOTE Confidence: 0.8061934225

00:19:47.681 --> 00:19:51.818 someone wants to go through the method.

NOTE Confidence: 0.8061934225

00:19:51.818 --> 00:19:55.155 Uh. And that gives you this some examples.

NOTE Confidence: 0.8061934225

00:19:55.160 --> 00:19:58.840 This one would be 0000 and

NOTE Confidence: 0.8061934225

00:19:58.840 --> 00:20:01.052 the probability is 37%.

NOTE Confidence: 0.8061934225

00:20:01.052 --> 00:20:04.892 This one will be 9843 and the probability

NOTE Confidence: 0.8061934225

00:20:04.892 --> 00:20:07.909 of it being awake is zero and so on.

NOTE Confidence: 0.8061934225

00:20:07.910 --> 00:20:09.598 OK the validation again.

NOTE Confidence: 0.8061934225

00:20:09.598 --> 00:20:12.130 I'm not going to go through

NOTE Confidence: 0.8061934225

00:20:12.221 --> 00:20:14.009 there several studies.
NOTE Confidence: 0.8061934225

00:20:14.010 --> 00:20:16.716 Some of them by arms length
NOTE Confidence: 0.8061934225

00:20:16.716 --> 00:20:19.486 investigators to show that it really
NOTE Confidence: 0.8061934225

00:20:19.486 --> 00:20:22.120 does reflect the depth of sleep.
NOTE Confidence: 0.8061934225

00:20:22.120 --> 00:20:24.760 In addition to these validation studies,
NOTE Confidence: 0.8061934225

00:20:24.760 --> 00:20:25.948 there are numerous studies.
NOTE Confidence: 0.8061934225

00:20:25.948 --> 00:20:27.433 I don't know how many,
NOTE Confidence: 0.8061934225

00:20:27.440 --> 00:20:27.999 again,
NOTE Confidence: 0.8061934225

00:20:27.999 --> 00:20:30.235 by independent investigators using
NOTE Confidence: 0.8061934225

00:20:30.235 --> 00:20:33.710 or P to show association with
NOTE Confidence: 0.8061934225

00:20:33.710 --> 00:20:36.132 different outcomes like future
NOTE Confidence: 0.8061934225

00:20:36.132 --> 00:20:39.342 occurrence of my cognitive impairment
NOTE Confidence: 0.8061934225

00:20:39.342 --> 00:20:42.860 or driving accidents or whatever,
NOTE Confidence: 0.8061934225

00:20:42.860 --> 00:20:44.018 and all of them are quite.
NOTE Confidence: 0.8061934225

00:20:44.020 --> 00:20:44.330 Positive,
NOTE Confidence: 0.8061934225

00:20:44.330 --> 00:20:47.120 but I want to get into the meat now.

NOTE Confidence: 0.8061934225
00:20:47.120 --> 00:20:49.128 The most compelling validation
NOTE Confidence: 0.8061934225
00:20:49.128 --> 00:20:52.140 is the relation between what RP
NOTE Confidence: 0.8061934225
00:20:52.225 --> 00:20:54.607 is right now and the probability
NOTE Confidence: 0.8061934225
00:20:54.607 --> 00:20:57.146 of an arousal or awakening or
NOTE Confidence: 0.8061934225
00:20:57.146 --> 00:20:59.756 caring in the next 30 seconds.
NOTE Confidence: 0.8061934225
00:20:59.760 --> 00:21:01.615 Not right now, but in the next.
NOTE Confidence: 0.8061934225
00:21:01.620 --> 00:21:04.892 So that shows you how close you are
NOTE Confidence: 0.8061934225
00:21:04.892 --> 00:21:07.859 to being spontaneously aroused.
NOTE Confidence: 0.8061934225
00:21:07.860 --> 00:21:09.580 Uhm?
NOTE Confidence: 0.8061934225
00:21:09.580 --> 00:21:14.220 The this this relation is is amazingly good,
NOTE Confidence: 0.8061934225
00:21:14.220 --> 00:21:16.428 so it shows.
NOTE Confidence: 0.8061934225
00:21:16.428 --> 00:21:20.470 Again these are 5282 hundred apples
NOTE Confidence: 0.8061934225
00:21:20.470 --> 00:21:25.099 with OR P in the first decile and
NOTE Confidence: 0.8061934225
00:21:25.099 --> 00:21:27.253 you can see the probability of
NOTE Confidence: 0.8061934225
00:21:27.253 --> 00:21:29.319 arousal occurring in the next step.
NOTE Confidence: 0.8061934225

00:21:29.320 --> 00:21:30.820 AC is very low,
NOTE Confidence: 0.8061934225

00:21:30.820 --> 00:21:33.070 but as the current over P
NOTE Confidence: 0.8061934225

00:21:33.171 --> 00:21:35.279 gets higher and higher,
NOTE Confidence: 0.8061934225

00:21:35.280 --> 00:21:38.178 the probability of arousal goes up and
NOTE Confidence: 0.8061934225

00:21:38.178 --> 00:21:41.964 up so that by by the time or current or.
NOTE Confidence: 0.8061934225

00:21:41.970 --> 00:21:44.532 PS2 there you know it's almost certain
NOTE Confidence: 0.8061934225

00:21:44.532 --> 00:21:47.176 you will wake up or get an arousal.
NOTE Confidence: 0.8061934225

00:21:47.180 --> 00:21:49.196 So this is this is the main
NOTE Confidence: 0.8061934225

00:21:49.196 --> 00:21:51.313 evidence now that there is a
NOTE Confidence: 0.8061934225

00:21:51.313 --> 00:21:52.889 linear relation between current,
NOTE Confidence: 0.8061934225

00:21:52.890 --> 00:21:55.179 what we measure as current or P,
NOTE Confidence: 0.8061934225

00:21:55.180 --> 00:21:58.673 and the likelihood of an arousal which
NOTE Confidence: 0.8061934225

00:21:58.673 --> 00:22:01.470 translates into the arousal index.
NOTE Confidence: 0.8061934225

00:22:01.470 --> 00:22:06.374 So what are the potential applications of RP?
NOTE Confidence: 0.8061934225

00:22:06.380 --> 00:22:09.212 The first one which is a
NOTE Confidence: 0.8061934225

00:22:09.212 --> 00:22:12.140 new index I came up with.

NOTE Confidence: 0.8061934225

00:22:12.140 --> 00:22:16.444 Using the ORP is to measure sleep adequacy.

NOTE Confidence: 0.8061934225

00:22:16.450 --> 00:22:18.762 Like you know the the ASM says you

NOTE Confidence: 0.8061934225

00:22:18.762 --> 00:22:20.959 need seven or eight hours of sleep.

NOTE Confidence: 0.8061934225

00:22:20.960 --> 00:22:22.280 But what kind of sleep?

NOTE Confidence: 0.8061934225

00:22:22.280 --> 00:22:24.457 I mean, if your sleep is poor,

NOTE Confidence: 0.8061934225

00:22:24.460 --> 00:22:26.098 you need more than seven or

NOTE Confidence: 0.8061934225

00:22:26.098 --> 00:22:27.660 eight hours or some people.

NOTE Confidence: 0.8061934225

00:22:27.660 --> 00:22:29.837 Not everybody needs 7 or 8 hours.

NOTE Confidence: 0.8061934225

00:22:29.840 --> 00:22:32.150 There are short sleepers and long sleepers,

NOTE Confidence: 0.8061934225

00:22:32.150 --> 00:22:33.586 not for any disease,

NOTE Confidence: 0.8061934225

00:22:33.586 --> 00:22:35.381 but because of the bell

NOTE Confidence: 0.8061934225

00:22:35.381 --> 00:22:36.869 shaped curve of sleep,

NOTE Confidence: 0.8061934225

00:22:36.870 --> 00:22:37.630 sleep needs.

NOTE Confidence: 0.8061934225

00:22:37.630 --> 00:22:40.670 So one of the nice things about RP

NOTE Confidence: 0.802821855333333

00:22:40.752 --> 00:22:42.447 is that you can tell.

NOTE Confidence: 0.802821855333333

00:22:42.450 --> 00:22:43.854 Whether the patient sleep
NOTE Confidence: 0.802821855333333

00:22:43.854 --> 00:22:45.258 is adequate for him.
NOTE Confidence: 0.802821855333333

00:22:45.260 --> 00:22:48.707 In other words, this is a a good way.
NOTE Confidence: 0.802821855333333

00:22:48.710 --> 00:22:52.616 To two to figure out how much
NOTE Confidence: 0.802821855333333

00:22:52.616 --> 00:22:55.568 sleep the patient needs. Uh,
NOTE Confidence: 0.802821855333333

00:22:55.568 --> 00:22:59.510 this is 11 histogram that you are used to.
NOTE Confidence: 0.802821855333333

00:22:59.510 --> 00:23:02.100 And of course it looks perfectly normal
NOTE Confidence: 0.802821855333333

00:23:02.100 --> 00:23:05.564 and you see what the 32nd over P,
NOTE Confidence: 0.802821855333333

00:23:05.570 --> 00:23:08.098 so this would be about 800 or 900
NOTE Confidence: 0.802821855333333

00:23:08.098 --> 00:23:10.530 epochs and this is the time course.
NOTE Confidence: 0.802821855333333

00:23:10.530 --> 00:23:13.266 So this is the first cycle and you see
NOTE Confidence: 0.802821855333333

00:23:13.266 --> 00:23:15.160 sleep going progressively down with
NOTE Confidence: 0.802821855333333

00:23:15.160 --> 00:23:18.339 in stage two when it hits stage three.
NOTE Confidence: 0.802821855333333

00:23:18.340 --> 00:23:20.482 It's very low down and in REM
NOTE Confidence: 0.802821855333333

00:23:20.482 --> 00:23:23.159 sleep in many patients will get to
NOTE Confidence: 0.802821855333333

00:23:23.159 --> 00:23:25.259 that later of quite interesting.

NOTE Confidence: 0.802821855333333
00:23:25.260 --> 00:23:26.784 In many patients,
NOTE Confidence: 0.802821855333333
00:23:26.784 --> 00:23:30.340 the RP during REM sleep is much
NOTE Confidence: 0.802821855333333
00:23:30.446 --> 00:23:34.177 higher than RP during non REM sleep.
NOTE Confidence: 0.802821855333333
00:23:34.180 --> 00:23:36.364 You can see it here, all of them.
NOTE Confidence: 0.802821855333333
00:23:36.364 --> 00:23:38.104 But another important thing is
NOTE Confidence: 0.802821855333333
00:23:38.104 --> 00:23:40.677 is that you see that there is a
NOTE Confidence: 0.802821855333333
00:23:40.677 --> 00:23:43.041 trend upwards in the RP despite the
NOTE Confidence: 0.802821855333333
00:23:43.041 --> 00:23:45.213 oscillations up and down that there
NOTE Confidence: 0.802821855333333
00:23:45.213 --> 00:23:48.310 is a trend upwards which gives us an
NOTE Confidence: 0.802821855333333
00:23:48.310 --> 00:23:51.280 idea about how restorative sleep is.
NOTE Confidence: 0.802821855333333
00:23:51.280 --> 00:23:53.390 So if or P goes up a lot by the
NOTE Confidence: 0.802821855333333
00:23:53.461 --> 00:23:54.617 end of the night,
NOTE Confidence: 0.802821855333333
00:23:54.620 --> 00:23:56.738 we know that the patient had
NOTE Confidence: 0.802821855333333
00:23:56.738 --> 00:23:58.660 a lot of restorative sleep.
NOTE Confidence: 0.802821855333333
00:23:58.660 --> 00:24:01.132 So and then I'll show you
NOTE Confidence: 0.802821855333333

00:24:01.132 --> 00:24:03.180 other other patients right now.
NOTE Confidence: 0.8028218553333333

00:24:03.180 --> 00:24:04.170 So the.
NOTE Confidence: 0.8028218553333333

00:24:04.170 --> 00:24:07.140 What is called cumulative sleep index
NOTE Confidence: 0.8028218553333333

00:24:07.140 --> 00:24:10.757 or to measure sleep adequacy is.
NOTE Confidence: 0.8028218553333333

00:24:10.760 --> 00:24:13.350 Is that we measure this the the
NOTE Confidence: 0.8028218553333333

00:24:13.350 --> 00:24:15.850 the reduction in RP every airport?
NOTE Confidence: 0.8028218553333333

00:24:15.850 --> 00:24:18.546 So in this case it's gone down from
NOTE Confidence: 0.8028218553333333

00:24:18.546 --> 00:24:21.938 week to week level to maybe five.
NOTE Confidence: 0.8028218553333333

00:24:21.940 --> 00:24:24.285 So the delta RP would be two.
NOTE Confidence: 0.8028218553333333

00:24:24.290 --> 00:24:27.182 We can do that for every airport and
NOTE Confidence: 0.8028218553333333

00:24:27.182 --> 00:24:30.748 add them all up during the study.
NOTE Confidence: 0.8028218553333333

00:24:30.748 --> 00:24:34.376 So in this particular patient it was 818.
NOTE Confidence: 0.8028218553333333

00:24:34.376 --> 00:24:36.968 Now that number doesn't mean anything
NOTE Confidence: 0.8028218553333333

00:24:36.968 --> 00:24:39.563 until you can see the normal
NOTE Confidence: 0.8028218553333333

00:24:39.563 --> 00:24:41.643 values than normal values are.
NOTE Confidence: 0.8028218553333333

00:24:41.650 --> 00:24:44.890 Or between 570 to 700.

NOTE Confidence: 0.802821855333333
00:24:44.890 --> 00:24:47.440 These are normally on sleepers.
NOTE Confidence: 0.802821855333333
00:24:47.440 --> 00:24:50.152 Uh, so that gives you an idea that
NOTE Confidence: 0.802821855333333
00:24:50.152 --> 00:24:52.419 this patient needs a lot of sleep.
NOTE Confidence: 0.802821855333333
00:24:52.420 --> 00:24:53.860 But he's got good sleep,
NOTE Confidence: 0.802821855333333
00:24:53.860 --> 00:24:55.368 normal sleep.
NOTE Confidence: 0.802821855333333
00:24:55.368 --> 00:24:58.230 The second patient you see.
NOTE Confidence: 0.802821855333333
00:24:58.230 --> 00:25:00.030 He also has fairly normal sleep,
NOTE Confidence: 0.802821855333333
00:25:00.030 --> 00:25:02.886 maybe a little bit more weight time,
NOTE Confidence: 0.802821855333333
00:25:02.890 --> 00:25:04.834 but you can see his OR P now.
NOTE Confidence: 0.802821855333333
00:25:04.840 --> 00:25:06.910 You can still see the cycles,
NOTE Confidence: 0.802821855333333
00:25:06.910 --> 00:25:11.250 but but now his average or P is quite low.
NOTE Confidence: 0.802821855333333
00:25:11.250 --> 00:25:13.987 And when you multiply it by total
NOTE Confidence: 0.802821855333333
00:25:13.987 --> 00:25:17.664 sleep time we get and and total of 482,
NOTE Confidence: 0.802821855333333
00:25:17.664 --> 00:25:20.576 which is, which is much less than this.
NOTE Confidence: 0.802821855333333
00:25:20.580 --> 00:25:22.488 And and then here is another.
NOTE Confidence: 0.802821855333333

00:25:22.490 --> 00:25:25.050 Patient with insomnia and
NOTE Confidence: 0.802821855333333

00:25:25.050 --> 00:25:26.970 short sleep duration,
NOTE Confidence: 0.802821855333333

00:25:26.970 --> 00:25:30.570 and again he's got now a lot of awake time,
NOTE Confidence: 0.802821855333333

00:25:30.570 --> 00:25:33.160 but still a lot of end too.
NOTE Confidence: 0.802821855333333

00:25:33.160 --> 00:25:34.666 And some entry,
NOTE Confidence: 0.802821855333333

00:25:34.666 --> 00:25:38.180 and yet his his integrated amount of
NOTE Confidence: 0.802821855333333

00:25:38.279 --> 00:25:41.943 sleep is is maybe 1/3 of this patient.
NOTE Confidence: 0.802821855333333

00:25:41.950 --> 00:25:45.667 Now how do we know like if if you?
NOTE Confidence: 0.802821855333333

00:25:45.670 --> 00:25:47.710 If you take this patient number
NOTE Confidence: 0.802821855333333

00:25:47.710 --> 00:25:49.929 one and stop the study here,
NOTE Confidence: 0.802821855333333

00:25:49.930 --> 00:25:52.250 because this is 7 hours or six hours,
NOTE Confidence: 0.802821855333333

00:25:52.250 --> 00:25:53.870 he has to go to work.
NOTE Confidence: 0.802821855333333

00:25:53.870 --> 00:25:57.650 You you will see that he had deep sleep.
NOTE Confidence: 0.802821855333333

00:25:57.650 --> 00:26:00.269 And you say this is a normal sleep study,
NOTE Confidence: 0.784721287692308

00:26:00.270 --> 00:26:03.693 but in reality is orpa didn't go
NOTE Confidence: 0.784721287692308

00:26:03.693 --> 00:26:07.120 up very much during the study.

NOTE Confidence: 0.784721287692308
00:26:07.120 --> 00:26:09.022 So this patient, you can suspect
NOTE Confidence: 0.784721287692308
00:26:09.022 --> 00:26:11.170 that he didn't get enough sleep.
NOTE Confidence: 0.784721287692308
00:26:11.170 --> 00:26:13.725 We don't yet know what is eight.
NOTE Confidence: 0.784721287692308
00:26:13.730 --> 00:26:16.352 180 may have 500 here by
NOTE Confidence: 0.784721287692308
00:26:16.352 --> 00:26:18.590 this time instead of 800.
NOTE Confidence: 0.784721287692308
00:26:18.590 --> 00:26:20.678 So in patients like this that
NOTE Confidence: 0.784721287692308
00:26:20.678 --> 00:26:22.967 have a high number like this or
NOTE Confidence: 0.784721287692308
00:26:22.967 --> 00:26:25.336 or the over P doesn't change
NOTE Confidence: 0.784721287692308
00:26:25.336 --> 00:26:28.060 very much during a regular time.
NOTE Confidence: 0.784721287692308
00:26:28.060 --> 00:26:28.834 6-7 hours.
NOTE Confidence: 0.784721287692308
00:26:28.834 --> 00:26:31.930 It would be nice to actually let let
NOTE Confidence: 0.784721287692308
00:26:32.022 --> 00:26:34.718 the patient sleep without any restriction,
NOTE Confidence: 0.784721287692308
00:26:34.718 --> 00:26:37.490 so you can, for example ask the patient.
NOTE Confidence: 0.784721287692308
00:26:37.490 --> 00:26:41.045 On the long weekend to do a home study
NOTE Confidence: 0.784721287692308
00:26:41.045 --> 00:26:44.329 of EG and and and let him sleep.
NOTE Confidence: 0.784721287692308

00:26:44.330 --> 00:26:46.073 You know the first two days of
NOTE Confidence: 0.784721287692308

00:26:46.073 --> 00:26:47.774 the weekend you can sleep as much
NOTE Confidence: 0.784721287692308

00:26:47.774 --> 00:26:49.323 as you want it to be,
NOTE Confidence: 0.784721287692308

00:26:49.323 --> 00:26:51.360 to to lose any sleep loss that
NOTE Confidence: 0.784721287692308

00:26:51.435 --> 00:26:53.619 he had and measured this number
NOTE Confidence: 0.784721287692308

00:26:53.619 --> 00:26:56.240 that that you know if he can sleep
NOTE Confidence: 0.784721287692308

00:26:56.240 --> 00:26:59.600 818 units in a study that means
NOTE Confidence: 0.784721287692308

00:26:59.600 --> 00:27:02.639 he needs a lot of sleep.
NOTE Confidence: 0.784721287692308

00:27:02.640 --> 00:27:05.224 So if the patient has symptoms and this
NOTE Confidence: 0.784721287692308

00:27:05.224 --> 00:27:07.839 is the social social problem that.
NOTE Confidence: 0.784721287692308

00:27:07.840 --> 00:27:10.248 We have now if the patient has
NOTE Confidence: 0.784721287692308

00:27:10.248 --> 00:27:12.080 symptoms and during the regular
NOTE Confidence: 0.784721287692308

00:27:12.080 --> 00:27:13.900 sleep study had only 500,
NOTE Confidence: 0.784721287692308

00:27:13.900 --> 00:27:17.460 but on the long weekend on Monday he had 18.
NOTE Confidence: 0.784721287692308

00:27:17.460 --> 00:27:19.404 You know this patient needs more
NOTE Confidence: 0.784721287692308

00:27:19.404 --> 00:27:21.484 sleep and maybe the advice would

NOTE Confidence: 0.784721287692308
00:27:21.484 --> 00:27:23.264 be remember everything I'm going
NOTE Confidence: 0.784721287692308
00:27:23.264 --> 00:27:25.767 to say from now on is speculative.
NOTE Confidence: 0.784721287692308
00:27:25.770 --> 00:27:27.770 These are only my interpretations,
NOTE Confidence: 0.784721287692308
00:27:27.770 --> 00:27:30.297 but they make a lot of sense
NOTE Confidence: 0.784721287692308
00:27:30.297 --> 00:27:31.770 and therefore they are,
NOTE Confidence: 0.784721287692308
00:27:31.770 --> 00:27:33.849 but they're worth testing in the clinic
NOTE Confidence: 0.784721287692308
00:27:33.849 --> 00:27:36.118 to see whether they are right or wrong.
NOTE Confidence: 0.784721287692308
00:27:36.120 --> 00:27:38.200 So if you have a patient like this.
NOTE Confidence: 0.784721287692308
00:27:38.200 --> 00:27:40.540 You you know that he needs.
NOTE Confidence: 0.784721287692308
00:27:40.540 --> 00:27:42.129 He needs a lot of sleep and
NOTE Confidence: 0.784721287692308
00:27:42.129 --> 00:27:44.027 maybe he can be advised that can
NOTE Confidence: 0.784721287692308
00:27:44.027 --> 00:27:45.761 be subject to a clinical trial.
NOTE Confidence: 0.784721287692308
00:27:45.770 --> 00:27:47.754 If you take a patient like that and
NOTE Confidence: 0.784721287692308
00:27:47.754 --> 00:27:49.776 tell him go to bed an hour earlier,
NOTE Confidence: 0.784721287692308
00:27:49.780 --> 00:27:51.900 two hours early or get up an hour,
NOTE Confidence: 0.784721287692308

00:27:51.900 --> 00:27:53.890 maybe his symptoms will disappear.
NOTE Confidence: 0.784721287692308

00:27:53.890 --> 00:27:56.278 That needs to be clinical testing
NOTE Confidence: 0.784721287692308

00:27:56.280 --> 00:27:59.381 this patient you know he's got a
NOTE Confidence: 0.784721287692308

00:27:59.381 --> 00:28:02.550 low amount of sleep but his his,
NOTE Confidence: 0.784721287692308

00:28:02.550 --> 00:28:05.295 his or P seems to creep up very nicely,
NOTE Confidence: 0.784721287692308

00:28:05.300 --> 00:28:07.564 so maybe that's all he needs and that
NOTE Confidence: 0.784721287692308

00:28:07.564 --> 00:28:09.694 would be there. Just fine, you know.
NOTE Confidence: 0.784721287692308

00:28:09.694 --> 00:28:11.684 We don't worry about his or P
NOTE Confidence: 0.784721287692308

00:28:11.684 --> 00:28:13.154 being too low because it because
NOTE Confidence: 0.784721287692308

00:28:13.154 --> 00:28:15.507 it is a response to the fact that
NOTE Confidence: 0.784721287692308

00:28:15.507 --> 00:28:17.057 he doesn't need much sleep.
NOTE Confidence: 0.784721287692308

00:28:17.060 --> 00:28:18.256 On the other hand,
NOTE Confidence: 0.784721287692308

00:28:18.256 --> 00:28:20.857 this one also is is his creeping up
NOTE Confidence: 0.784721287692308

00:28:20.857 --> 00:28:23.769 his or PS creeping up across the night.
NOTE Confidence: 0.784721287692308

00:28:23.770 --> 00:28:26.610 So this is a patient that we now
NOTE Confidence: 0.784721287692308

00:28:26.610 --> 00:28:29.180 identify as one with hyperarousal.

NOTE Confidence: 0.784721287692308
00:28:29.180 --> 00:28:31.427 These people are not sleepy at all,
NOTE Confidence: 0.784721287692308
00:28:31.430 --> 00:28:33.467 despite the fact that that they have
NOTE Confidence: 0.784721287692308
00:28:33.467 --> 00:28:35.969 a lot of their very little sleep.
NOTE Confidence: 0.784721287692308
00:28:35.970 --> 00:28:37.978 And again it is nice to be aware
NOTE Confidence: 0.784721287692308
00:28:37.978 --> 00:28:39.200 of the fact that.
NOTE Confidence: 0.784721287692308
00:28:39.200 --> 00:28:42.315 This patient sleep needs are very low,
NOTE Confidence: 0.784721287692308
00:28:42.320 --> 00:28:44.720 even though they don't have.
NOTE Confidence: 0.784721287692308
00:28:44.720 --> 00:28:47.480 They don't have OSA or anything
NOTE Confidence: 0.784721287692308
00:28:47.480 --> 00:28:50.006 because these people are probably
NOTE Confidence: 0.784721287692308
00:28:50.006 --> 00:28:53.016 sitting ducks for getting insomnia.
NOTE Confidence: 0.784721287692308
00:28:53.020 --> 00:28:55.588 If if they have any excessive
NOTE Confidence: 0.784721287692308
00:28:55.588 --> 00:28:56.444 arousal stimuli.
NOTE Confidence: 0.793143065789473
00:28:59.440 --> 00:29:01.841 OK, now the second, in the second
NOTE Confidence: 0.793143065789473
00:29:01.841 --> 00:29:05.403 use of this or P is investigation of
NOTE Confidence: 0.793143065789473
00:29:05.403 --> 00:29:07.367 mechanism of sleep fragmentation.
NOTE Confidence: 0.793143065789473

00:29:07.370 --> 00:29:10.856 So this is the linear relation between.
NOTE Confidence: 0.793143065789473

00:29:10.860 --> 00:29:13.758 Current or P?
NOTE Confidence: 0.793143065789473

00:29:13.760 --> 00:29:16.850 And the expected arousal index.
NOTE Confidence: 0.793143065789473

00:29:16.850 --> 00:29:19.798 And this is the.
NOTE Confidence: 0.793143065789473

00:29:19.800 --> 00:29:23.658 95 confidence interval in normal people.
NOTE Confidence: 0.793143065789473

00:29:23.660 --> 00:29:26.820 So now I'm going to plug three different
NOTE Confidence: 0.793143065789473

00:29:26.820 --> 00:29:28.799 patients against this background.
NOTE Confidence: 0.793143065789473

00:29:28.800 --> 00:29:31.130 This is the normal background.
NOTE Confidence: 0.793143065789473

00:29:31.130 --> 00:29:33.100 Now this patient has as
NOTE Confidence: 0.793143065789473

00:29:33.100 --> 00:29:35.295 an arousal index of 48.
NOTE Confidence: 0.793143065789473

00:29:35.295 --> 00:29:38.985 He's gotten each oil for 50,
NOTE Confidence: 0.793143065789473

00:29:38.990 --> 00:29:42.390 so he's got severe sleep apnea and his
NOTE Confidence: 0.793143065789473

00:29:42.390 --> 00:29:44.945 sleep apnea is associated with a lot
NOTE Confidence: 0.793143065789473

00:29:44.945 --> 00:29:48.100 of arousal and his older P is high.
NOTE Confidence: 0.793143065789473

00:29:48.100 --> 00:29:50.627 So because his or her peers high,
NOTE Confidence: 0.793143065789473

00:29:50.630 --> 00:29:52.718 we expect a lot of arousals.

NOTE Confidence: 0.793143065789473

00:29:52.720 --> 00:29:55.968 So in this case the high arousal

NOTE Confidence: 0.793143065789473

00:29:55.968 --> 00:29:59.259 index is because of his sleep apnea,

NOTE Confidence: 0.793143065789473

00:29:59.260 --> 00:30:02.437 but we don't know whether the high or P.

NOTE Confidence: 0.793143065789473

00:30:02.440 --> 00:30:05.928 In other words, the light sleep is because.

NOTE Confidence: 0.793143065789473

00:30:05.930 --> 00:30:09.282 Of the OSC or is because of a

NOTE Confidence: 0.793143065789473

00:30:09.282 --> 00:30:12.010 central problem like like a hyper

NOTE Confidence: 0.793143065789473

00:30:12.010 --> 00:30:15.260 arousal state or or poor sleep need.

NOTE Confidence: 0.793143065789473

00:30:15.260 --> 00:30:20.400 Uh, uh. Billion problem and so on.

NOTE Confidence: 0.94166418

00:30:22.750 --> 00:30:24.370 So this is one patient.

NOTE Confidence: 0.94166418

00:30:24.370 --> 00:30:27.682 Then we get a patient like this who has

NOTE Confidence: 0.94166418

00:30:27.682 --> 00:30:32.110 no hi, no problems and he's also got a

NOTE Confidence: 0.94166418

00:30:32.110 --> 00:30:34.604 high arousal awakening index relative

NOTE Confidence: 0.94166418

00:30:34.604 --> 00:30:38.558 to his ORP at an RP of .8 we expect

NOTE Confidence: 0.94166418

00:30:38.558 --> 00:30:41.550 only 20 with an upper limit of 30.

NOTE Confidence: 0.94166418

00:30:41.550 --> 00:30:45.708 So so, So what does that mean?

NOTE Confidence: 0.94166418

00:30:45.710 --> 00:30:48.070 That means to me anyway?

NOTE Confidence: 0.94166418

00:30:48.070 --> 00:30:49.936 Like I say all that needs

NOTE Confidence: 0.94166418

00:30:49.936 --> 00:30:51.680 to be confirmed it means.

NOTE Confidence: 0.94166418

00:30:51.680 --> 00:30:53.955 That this patient has something

NOTE Confidence: 0.94166418

00:30:53.955 --> 00:30:56.820 bothering his sleep that wakes him up.

NOTE Confidence: 0.94166418

00:30:56.820 --> 00:30:59.596 That is not hi and pilens under full.

NOTE Confidence: 0.94166418

00:30:59.600 --> 00:31:01.560 We're not seeing it in the sleep

NOTE Confidence: 0.94166418

00:31:01.560 --> 00:31:03.640 study in a patient like this,

NOTE Confidence: 0.94166418

00:31:03.640 --> 00:31:06.175 then high arousal index with

NOTE Confidence: 0.94166418

00:31:06.175 --> 00:31:09.116 a normal or P and nothing to

NOTE Confidence: 0.94166418

00:31:09.116 --> 00:31:11.230 see in the sleep in the sleep.

NOTE Confidence: 0.94166418

00:31:11.230 --> 00:31:13.400 Study what I would do.

NOTE Confidence: 0.94166418

00:31:13.400 --> 00:31:15.850 I don't do any clinical work anymore

NOTE Confidence: 0.94166418

00:31:15.850 --> 00:31:18.734 so I can pontificate what I would do

NOTE Confidence: 0.94166418

00:31:18.734 --> 00:31:21.969 is to go over the organ system what?

NOTE Confidence: 0.94166418

00:31:21.970 --> 00:31:23.872 We used to call functional inquiry

NOTE Confidence: 0.94166418

00:31:23.872 --> 00:31:26.569 to see if he has any GI problems.

NOTE Confidence: 0.94166418

00:31:26.570 --> 00:31:29.978 Colleagues, itching, pain in the joints,

NOTE Confidence: 0.94166418

00:31:29.980 --> 00:31:32.506 anything that might be a source

NOTE Confidence: 0.94166418

00:31:32.506 --> 00:31:35.031 of arousal stimuli that does not

NOTE Confidence: 0.94166418

00:31:35.031 --> 00:31:37.323 show itself in the sleep study.

NOTE Confidence: 0.94166418

00:31:37.330 --> 00:31:39.508 And here is a third pitch.

NOTE Confidence: 0.94166418

00:31:39.510 --> 00:31:42.240 A third patient who has.

NOTE Confidence: 0.94166418

00:31:42.240 --> 00:31:44.890 Severe sleep apnea and not

NOTE Confidence: 0.94166418

00:31:44.890 --> 00:31:47.010 as bad arousal index,

NOTE Confidence: 0.94166418

00:31:47.010 --> 00:31:49.066 but his or P is low and I'm

NOTE Confidence: 0.94166418

00:31:49.066 --> 00:31:51.176 sure some of you have seen this.

NOTE Confidence: 0.94166418

00:31:51.180 --> 00:31:53.204 Sometimes people with even

NOTE Confidence: 0.94166418

00:31:53.204 --> 00:31:55.734 in in stage three sleep.

NOTE Confidence: 0.94166418

00:31:55.740 --> 00:31:56.872 They have sleep apnea,

NOTE Confidence: 0.94166418

00:31:56.872 --> 00:31:59.199 but it doesn't wake them up that much.

NOTE Confidence: 0.94166418

00:31:59.200 --> 00:32:03.648 And this now is a patient who has
NOTE Confidence: 0.94166418

00:32:03.650 --> 00:32:06.116 severe severe sleep apnea that wakes
NOTE Confidence: 0.94166418

00:32:06.116 --> 00:32:09.922 him up or even without waking up that
NOTE Confidence: 0.94166418

00:32:09.922 --> 00:32:12.730 causes oscillations in breathing.
NOTE Confidence: 0.94166418

00:32:12.730 --> 00:32:15.098 Uh, even though he sleep is very deep
NOTE Confidence: 0.94166418

00:32:15.098 --> 00:32:18.326 and we do have lots of examples of all these.
NOTE Confidence: 0.94166418

00:32:18.330 --> 00:32:22.018 So that's how if you plot the patients
NOTE Confidence: 0.94166418

00:32:22.018 --> 00:32:24.888 arousal index and hi on this graph,
NOTE Confidence: 0.94166418

00:32:24.890 --> 00:32:26.410 you can sort of say,
NOTE Confidence: 0.94166418

00:32:26.410 --> 00:32:30.470 well this patient has has a low
NOTE Confidence: 0.94166418

00:32:30.470 --> 00:32:32.869 arousal threshold, high or P.
NOTE Confidence: 0.94166418

00:32:32.869 --> 00:32:35.760 This patient has a high arousal threshold,
NOTE Confidence: 0.94166418

00:32:35.760 --> 00:32:38.707 so this is the kind of patient
NOTE Confidence: 0.94166418

00:32:38.707 --> 00:32:40.849 that underwhelming now would say.
NOTE Confidence: 0.94166418

00:32:40.850 --> 00:32:41.266 You know,
NOTE Confidence: 0.94166418

00:32:41.266 --> 00:32:42.722 if we can make you sleep deeper,

NOTE Confidence: 0.94166418

00:32:42.730 --> 00:32:44.620 his sleep apnea will go away,

NOTE Confidence: 0.94166418

00:32:44.620 --> 00:32:46.628 whereas this one is sleep apnea will not

NOTE Confidence: 0.94166418

00:32:46.628 --> 00:32:48.752 go away if you make you sleep deeper

NOTE Confidence: 0.94166418

00:32:48.752 --> 00:32:50.414 because they sleep is already very

NOTE Confidence: 0.94166418

00:32:50.414 --> 00:32:52.367 deep and this is someone who sleep.

NOTE Confidence: 0.94166418

00:32:52.370 --> 00:32:53.774 Fragmentation is coming from

NOTE Confidence: 0.94166418

00:32:53.774 --> 00:32:55.529 somewhere else in the body.

NOTE Confidence: 0.94166418

00:32:55.530 --> 00:32:56.015 Again,

NOTE Confidence: 0.94166418

00:32:56.015 --> 00:32:58.440 these are all hypothesis that

NOTE Confidence: 0.94166418

00:32:58.440 --> 00:33:01.210 you guys need to confirm.

NOTE Confidence: 0.94166418

00:33:01.210 --> 00:33:04.482 The third use of or P because it

NOTE Confidence: 0.94166418

00:33:04.482 --> 00:33:07.170 is calculated every three seconds,

NOTE Confidence: 0.94166418

00:33:07.170 --> 00:33:10.034 is that it gives you an idea about

NOTE Confidence: 0.94166418

00:33:10.034 --> 00:33:12.350 the dynamics of sleep regression.

NOTE Confidence: 0.94166418

00:33:12.350 --> 00:33:15.920 Uh, so here are two patients.

NOTE Confidence: 0.94166418

00:33:15.920 --> 00:33:18.868 This is published also,
NOTE Confidence: 0.94166418

00:33:18.870 --> 00:33:21.360 so here is an arousal.
NOTE Confidence: 0.94166418

00:33:21.360 --> 00:33:24.267 Up to the up to the vertical line and
NOTE Confidence: 0.94166418

00:33:24.267 --> 00:33:27.589 we can see the order here is very high,
NOTE Confidence: 0.94166418

00:33:27.590 --> 00:33:30.866 so the work this is 3 second or pH
NOTE Confidence: 0.94166418

00:33:30.866 --> 00:33:34.500 very high full almost full wakefulness,
NOTE Confidence: 0.94166418

00:33:34.500 --> 00:33:36.523 and then he goes to sleep here
NOTE Confidence: 0.94166418

00:33:36.523 --> 00:33:37.770 at the vertical line.
NOTE Confidence: 0.94166418

00:33:37.770 --> 00:33:40.140 This is visually I drew it.
NOTE Confidence: 0.94166418

00:33:40.140 --> 00:33:42.940 And you can see now that he's
NOTE Confidence: 0.94166418

00:33:42.940 --> 00:33:44.140 changing to sleep.
NOTE Confidence: 0.69371406

00:33:44.140 --> 00:33:46.876 His over P goes down quickly,
NOTE Confidence: 0.69371406

00:33:46.880 --> 00:33:49.015 but only to about 11.2
NOTE Confidence: 0.69371406

00:33:49.015 --> 00:33:51.150 and then it lingers there.
NOTE Confidence: 0.69371406

00:33:51.150 --> 00:33:53.579 If you wait 10 minutes it will
NOTE Confidence: 0.69371406

00:33:53.579 --> 00:33:55.380 go down without arousals.

NOTE Confidence: 0.69371406
00:33:55.380 --> 00:33:57.996 It will go down to very low level,
NOTE Confidence: 0.69371406
00:33:58.000 --> 00:33:59.818 but of course he gives getting
NOTE Confidence: 0.69371406
00:33:59.818 --> 00:34:01.540 arousals because of the lower P,
NOTE Confidence: 0.69371406
00:34:01.540 --> 00:34:03.380 so that becomes very difficult.
NOTE Confidence: 0.69371406
00:34:03.380 --> 00:34:05.940 So this is we measure the RP in
NOTE Confidence: 0.69371406
00:34:05.940 --> 00:34:08.867 this in the 9 seconds immediately
NOTE Confidence: 0.69371406
00:34:08.867 --> 00:34:11.789 following the arousal and we call
NOTE Confidence: 0.69371406
00:34:11.789 --> 00:34:14.240 that over P9 and you can see that.
NOTE Confidence: 0.69371406
00:34:14.240 --> 00:34:15.275 In this patient,
NOTE Confidence: 0.69371406
00:34:15.275 --> 00:34:18.610 he's stuck with stuck at 1.5.
NOTE Confidence: 0.69371406
00:34:18.610 --> 00:34:21.526 Which is one of those transitional
NOTE Confidence: 0.69371406
00:34:21.526 --> 00:34:22.984 transitional states where
NOTE Confidence: 0.69371406
00:34:22.984 --> 00:34:24.667 anything can wake you up.
NOTE Confidence: 0.69371406
00:34:24.670 --> 00:34:26.294 On the other hand,
NOTE Confidence: 0.69371406
00:34:26.294 --> 00:34:28.445 this patients same arousal also
NOTE Confidence: 0.69371406

00:34:28.445 --> 00:34:31.115 caused caused very high or P.
NOTE Confidence: 0.69371406

00:34:31.120 --> 00:34:33.150 Here is the end of the arousal,
NOTE Confidence: 0.69371406

00:34:33.150 --> 00:34:36.230 and you can see the door P within
NOTE Confidence: 0.69371406

00:34:36.230 --> 00:34:39.060 9 seconds went down to almost 0.
NOTE Confidence: 0.69371406

00:34:39.060 --> 00:34:41.922 And now he becomes very resistant
NOTE Confidence: 0.69371406

00:34:41.922 --> 00:34:42.876 to arousals,
NOTE Confidence: 0.69371406

00:34:42.880 --> 00:34:45.868 so if he gets another hypopyon
NOTE Confidence: 0.69371406

00:34:45.868 --> 00:34:47.550 here right after this arousal,
NOTE Confidence: 0.69371406

00:34:47.550 --> 00:34:49.320 he's not likely to wake up,
NOTE Confidence: 0.69371406

00:34:49.320 --> 00:34:52.526 and Mila may may just actually stabilized,
NOTE Confidence: 0.69371406

00:34:52.530 --> 00:34:55.578 whereas this patient is stuck there.
NOTE Confidence: 0.69371406

00:34:55.580 --> 00:34:57.680 And for for several minutes,
NOTE Confidence: 0.69371406

00:34:57.680 --> 00:34:59.738 he would stay there unless he,
NOTE Confidence: 0.69371406

00:34:59.740 --> 00:35:01.810 unless he doesn't get an arousal.
NOTE Confidence: 0.69371406

00:35:01.810 --> 00:35:04.298 If he gets an arousal at any time,
NOTE Confidence: 0.69371406

00:35:04.300 --> 00:35:07.090 this would go up again and

NOTE Confidence: 0.69371406

00:35:07.090 --> 00:35:09.450 then come down again and.

NOTE Confidence: 0.69371406

00:35:09.450 --> 00:35:12.390 That's why you see the yeah,

NOTE Confidence: 0.69371406

00:35:12.390 --> 00:35:13.910 no, it's not here.

NOTE Confidence: 0.69371406

00:35:13.910 --> 00:35:14.210 OK,

NOTE Confidence: 0.69371406

00:35:14.210 --> 00:35:16.010 so I hope this is clear.

NOTE Confidence: 0.69371406

00:35:16.010 --> 00:35:19.511 So or P9 is a measure of how quickly

NOTE Confidence: 0.69371406

00:35:19.511 --> 00:35:22.830 the patient goes into deep sleep.

NOTE Confidence: 0.69371406

00:35:22.830 --> 00:35:23.670 If it's high,

NOTE Confidence: 0.69371406

00:35:23.670 --> 00:35:26.461 it means he lingers in in a in a in

NOTE Confidence: 0.69371406

00:35:26.461 --> 00:35:29.159 a light sleep for a long time and is

NOTE Confidence: 0.69371406

00:35:29.159 --> 00:35:31.304 more susceptible to getting arousals.

NOTE Confidence: 0.69371406

00:35:31.310 --> 00:35:34.518 And it's very hard to find a patient

NOTE Confidence: 0.69371406

00:35:34.518 --> 00:35:37.335 with very severe OSA or severe

NOTE Confidence: 0.69371406

00:35:37.335 --> 00:35:41.179 purlins with arousals that has the fasten RP.

NOTE Confidence: 0.69371406

00:35:41.180 --> 00:35:44.348 That is, that is not not that high,

NOTE Confidence: 0.69371406

00:35:44.350 --> 00:35:45.631 so this is.
NOTE Confidence: 0.69371406

00:35:45.631 --> 00:35:48.674 This is a very big risk,
NOTE Confidence: 0.69371406

00:35:48.674 --> 00:35:52.676 very big risk for recurrent arousal,
NOTE Confidence: 0.69371406

00:35:52.680 --> 00:35:53.676 and this guy.
NOTE Confidence: 0.69371406

00:35:53.676 --> 00:35:56.000 Then you know if he gets OSC,
NOTE Confidence: 0.69371406

00:35:56.000 --> 00:35:58.920 chances are he will get much fewer arousals
NOTE Confidence: 0.69371406

00:35:58.920 --> 00:36:01.450 then just like I showed you before.
NOTE Confidence: 0.69371406

00:36:01.450 --> 00:36:03.858 So this is the other way we can
NOTE Confidence: 0.69371406

00:36:03.858 --> 00:36:05.547 understand the what's underlying
NOTE Confidence: 0.69371406

00:36:05.547 --> 00:36:07.077 the patients problem.
NOTE Confidence: 0.69371406

00:36:07.080 --> 00:36:07.850 Uh.
NOTE Confidence: 0.834762198928572

00:36:10.060 --> 00:36:12.020 Oh, this is just this is just
NOTE Confidence: 0.834762198928572

00:36:12.020 --> 00:36:14.163 this is just showing you that even
NOTE Confidence: 0.834762198928572

00:36:14.163 --> 00:36:16.762 the one with the high or P9 will
NOTE Confidence: 0.834762198928572

00:36:16.762 --> 00:36:18.814 ultimately go down to deep sleep.
NOTE Confidence: 0.834762198928572

00:36:18.820 --> 00:36:22.060 If he's not aroused.

NOTE Confidence: 0.834762198928572
00:36:22.060 --> 00:36:26.420 Now this is the fun part and and what a.
NOTE Confidence: 0.834762198928572
00:36:26.420 --> 00:36:29.705 What what I'm deep into now and and I
NOTE Confidence: 0.834762198928572
00:36:29.705 --> 00:36:32.614 would like to spend the rest of the
NOTE Confidence: 0.834762198928572
00:36:32.620 --> 00:36:37.004 of the talk with you know before that.
NOTE Confidence: 0.834762198928572
00:36:37.010 --> 00:36:41.040 OK, so here is a section of a sleep study.
NOTE Confidence: 0.834762198928572
00:36:41.040 --> 00:36:43.964 Oxygen saturation the histogram.
NOTE Confidence: 0.834762198928572
00:36:43.964 --> 00:36:47.868 And this is our PC with you.
NOTE Confidence: 0.834762198928572
00:36:47.868 --> 00:36:50.949 See during stage two how much it goes down.
NOTE Confidence: 0.834762198928572
00:36:50.950 --> 00:36:54.214 Most of the range of RP happens here.
NOTE Confidence: 0.834762198928572
00:36:54.220 --> 00:36:56.200 But when he goes into RAM,
NOTE Confidence: 0.834762198928572
00:36:56.200 --> 00:36:58.136 the RP goes up.
NOTE Confidence: 0.834762198928572
00:36:58.136 --> 00:37:01.040 This patient has fairly severe sleep
NOTE Confidence: 0.834762198928572
00:37:01.134 --> 00:37:04.736 apnea and you can argue that that it is
NOTE Confidence: 0.834762198928572
00:37:04.736 --> 00:37:08.616 the sleep apnea that's fragmenting his ram.
NOTE Confidence: 0.834762198928572
00:37:08.620 --> 00:37:11.248 Here is another one.
NOTE Confidence: 0.834762198928572

00:37:11.250 --> 00:37:12.838 Very different, you know,
NOTE Confidence: 0.834762198928572

00:37:12.838 --> 00:37:16.537 gets into very deep sleep and you see he gets
NOTE Confidence: 0.834762198928572

00:37:16.537 --> 00:37:19.559 into stage three when he is way down there.
NOTE Confidence: 0.834762198928572

00:37:19.560 --> 00:37:21.885 But we don't see anything
NOTE Confidence: 0.834762198928572

00:37:21.885 --> 00:37:23.280 happening before that.
NOTE Confidence: 0.834762198928572

00:37:23.280 --> 00:37:26.080 Again, not again this patient.
NOTE Confidence: 0.834762198928572

00:37:26.080 --> 00:37:27.940 Now he goes into them,
NOTE Confidence: 0.834762198928572

00:37:27.940 --> 00:37:30.523 but his RAM or P is very
NOTE Confidence: 0.834762198928572

00:37:30.523 --> 00:37:32.090 close to another MRP,
NOTE Confidence: 0.834762198928572

00:37:32.090 --> 00:37:36.634 so you know in until now we've never
NOTE Confidence: 0.834762198928572

00:37:36.634 --> 00:37:39.470 really distinguished RAM RAM as being
NOTE Confidence: 0.834762198928572

00:37:39.470 --> 00:37:41.350 multiple stages different stages,
NOTE Confidence: 0.834762198928572

00:37:41.350 --> 00:37:43.700 whereas in reality RAM can
NOTE Confidence: 0.834762198928572

00:37:43.700 --> 00:37:45.739 be very close to awake.
NOTE Confidence: 0.834762198928572

00:37:45.740 --> 00:37:46.724 Like this patient,
NOTE Confidence: 0.834762198928572

00:37:46.724 --> 00:37:49.750 you see two which is very close to a week,

NOTE Confidence: 0.834762198928572
00:37:49.750 --> 00:37:51.862 whereas here is about .5 which
NOTE Confidence: 0.834762198928572
00:37:51.862 --> 00:37:53.270 is very deep sleep.
NOTE Confidence: 0.834762198928572
00:37:53.270 --> 00:37:54.774 And and you know,
NOTE Confidence: 0.834762198928572
00:37:54.774 --> 00:37:56.278 we didn't appreciate that
NOTE Confidence: 0.834762198928572
00:37:56.278 --> 00:37:58.337 until we got the RPC here.
NOTE Confidence: 0.834762198928572
00:37:58.340 --> 00:38:00.790 He's sleeping deep and he's
NOTE Confidence: 0.834762198928572
00:38:00.790 --> 00:38:02.260 getting seriously saturation,
NOTE Confidence: 0.834762198928572
00:38:02.260 --> 00:38:03.500 whereas here he doesn't
NOTE Confidence: 0.834762198928572
00:38:03.500 --> 00:38:05.360 because he wakes up right away.
NOTE Confidence: 0.7897528715
00:38:07.880 --> 00:38:10.208 So so, but you can argue that that
NOTE Confidence: 0.7897528715
00:38:10.208 --> 00:38:12.252 the reason this one is obvious
NOTE Confidence: 0.7897528715
00:38:12.252 --> 00:38:14.346 because he has severe sleep apnea,
NOTE Confidence: 0.7897528715
00:38:14.350 --> 00:38:18.409 so we put both patients on C PAP and
NOTE Confidence: 0.7897528715
00:38:18.409 --> 00:38:22.254 we eliminate the sleep apnea again.
NOTE Confidence: 0.7897528715
00:38:22.254 --> 00:38:25.326 You see, this patient still has a high
NOTE Confidence: 0.7897528715

00:38:25.326 --> 00:38:28.369 RPM ramp even though he has no sleep
NOTE Confidence: 0.7897528715

00:38:28.369 --> 00:38:31.519 apnea and this one has low or P and RAM,
NOTE Confidence: 0.7897528715

00:38:31.520 --> 00:38:33.718 even though he doesn't have sleep apnea,
NOTE Confidence: 0.7897528715

00:38:33.720 --> 00:38:37.390 so so that tells you that this is a trade.
NOTE Confidence: 0.7897528715

00:38:37.390 --> 00:38:41.566 For the patient and before I get into that,
NOTE Confidence: 0.7897528715

00:38:41.570 --> 00:38:44.384 we just confirmed in a recent study
NOTE Confidence: 0.7897528715

00:38:44.384 --> 00:38:47.098 that this is actually a treat.
NOTE Confidence: 0.7897528715

00:38:47.100 --> 00:38:51.194 We compared the Orpen and RAM in 2600.
NOTE Confidence: 0.7897528715

00:38:51.194 --> 00:38:54.386 People who had sleep heart health
NOTE Confidence: 0.7897528715

00:38:54.386 --> 00:38:55.990 one and two,
NOTE Confidence: 0.7897528715

00:38:55.990 --> 00:39:01.238 and this is the correlation between oh RPM.
NOTE Confidence: 0.7897528715

00:39:01.240 --> 00:39:02.266 One and two,
NOTE Confidence: 0.7897528715

00:39:02.266 --> 00:39:04.318 which are separated by five years.
NOTE Confidence: 0.7897528715

00:39:04.320 --> 00:39:07.169 So it shows that it shows that
NOTE Confidence: 0.7897528715

00:39:07.169 --> 00:39:10.328 oh RPM is a trait is really.
NOTE Confidence: 0.7897528715

00:39:10.330 --> 00:39:13.172 I mean this is intraclass correlation of .79,

NOTE Confidence: 0.7897528715

00:39:13.172 --> 00:39:15.224 which is which is very high.

NOTE Confidence: 0.7897528715

00:39:15.230 --> 00:39:17.715 Now going back here along with the

NOTE Confidence: 0.7897528715

00:39:17.715 --> 00:39:20.160 yoga masotti a colleague of mine,

NOTE Confidence: 0.7897528715

00:39:20.160 --> 00:39:22.344 we looked at the characteristics of

NOTE Confidence: 0.7897528715

00:39:22.344 --> 00:39:25.407 REM sleep as a function of Rambo RP.

NOTE Confidence: 0.7897528715

00:39:25.410 --> 00:39:27.918 So here are people with lower

NOTE Confidence: 0.7897528715

00:39:27.918 --> 00:39:30.010 MMORPG just like this one.

NOTE Confidence: 0.7897528715

00:39:30.010 --> 00:39:32.418 And here are people.

NOTE Confidence: 0.7897528715

00:39:32.418 --> 00:39:35.066 Like this fellow, so again,

NOTE Confidence: 0.7897528715

00:39:35.066 --> 00:39:37.992 these are the sleeper cell study people,

NOTE Confidence: 0.7897528715

00:39:38.000 --> 00:39:40.240 so we're talking about.

NOTE Confidence: 0.7897528715

00:39:40.240 --> 00:39:43.840 C, 5000 or 4000 is a very nice

NOTE Confidence: 0.7897528715

00:39:43.840 --> 00:39:47.310 correlation between Remo RP and how much

NOTE Confidence: 0.7897528715

00:39:47.310 --> 00:39:50.240 wake interruptions you have during RAM.

NOTE Confidence: 0.7897528715

00:39:50.240 --> 00:39:51.524 You see here.

NOTE Confidence: 0.7897528715

00:39:51.524 --> 00:39:53.236 This is interrupted here,
NOTE Confidence: 0.7897528715

00:39:53.240 --> 00:39:58.392 whereas here he's solid solid REM sleep so so
NOTE Confidence: 0.7897528715

00:39:58.392 --> 00:40:02.559 as well as there is less REM sleep we don't.
NOTE Confidence: 0.7897528715

00:40:02.560 --> 00:40:05.516 I don't have the figure if MORP is
NOTE Confidence: 0.7897528715

00:40:05.516 --> 00:40:07.840 high you get less less REM sleep
NOTE Confidence: 0.7897528715

00:40:07.917 --> 00:40:10.307 and more fragmented than sleep.
NOTE Confidence: 0.7897528715

00:40:10.310 --> 00:40:13.181 And we I think we all know the sort
NOTE Confidence: 0.7897528715

00:40:13.181 --> 00:40:16.798 of the the link between REM sleep,
NOTE Confidence: 0.7897528715

00:40:16.798 --> 00:40:19.854 fragmentation and say psychological
NOTE Confidence: 0.7897528715

00:40:19.854 --> 00:40:22.910 anxiety disorders and depression
NOTE Confidence: 0.7897528715

00:40:23.011 --> 00:40:25.136 and PTSD and all that.
NOTE Confidence: 0.7897528715

00:40:25.140 --> 00:40:27.695 So that's another use of sleep deaths.
NOTE Confidence: 0.7897528715

00:40:27.700 --> 00:40:31.093 Which of RP which we haven't been aware of,
NOTE Confidence: 0.7897528715

00:40:31.100 --> 00:40:34.754 and that could explain some of the.
NOTE Confidence: 0.7897528715

00:40:34.760 --> 00:40:35.906 Mental well,
NOTE Confidence: 0.7897528715

00:40:35.906 --> 00:40:39.344 well anxiety disorders and so on.

NOTE Confidence: 0.7897528715
00:40:39.350 --> 00:40:39.857 Finally,
NOTE Confidence: 0.7897528715
00:40:39.857 --> 00:40:42.899 nowadays we haven't published this yet,
NOTE Confidence: 0.7897528715
00:40:42.900 --> 00:40:45.196 but I'm about to submit the paper
NOTE Confidence: 0.7897528715
00:40:45.200 --> 00:40:49.238 this is using or P to describe
NOTE Confidence: 0.7897528715
00:40:49.238 --> 00:40:52.172 sleep architecture in addition to or
NOTE Confidence: 0.7897528715
00:40:52.172 --> 00:40:55.228 instead of the conventional system.
NOTE Confidence: 0.7897528715
00:40:55.230 --> 00:40:57.232 So you have seen this in broken
NOTE Confidence: 0.7897528715
00:40:57.232 --> 00:40:58.560 and broken graphs before.
NOTE Confidence: 0.7897528715
00:40:58.560 --> 00:41:01.200 So these are three awake epochs,
NOTE Confidence: 0.7897528715
00:41:01.200 --> 00:41:04.805 again showing the different or P levels.
NOTE Confidence: 0.7897528715
00:41:04.810 --> 00:41:08.626 These are four or five and two.
NOTE Confidence: 0.7897528715
00:41:08.626 --> 00:41:14.518 Oh, this is N1. And it's here.
NOTE Confidence: 0.7897528715
00:41:14.518 --> 00:41:18.550 And then four non REM RP again showing
NOTE Confidence: 0.7897528715
00:41:18.662 --> 00:41:22.550 degradation of RAM and this is N 3 so
NOTE Confidence: 0.7897528715
00:41:22.550 --> 00:41:27.575 this particular person is this is his
NOTE Confidence: 0.7897528715

00:41:27.575 --> 00:41:29.744 conventional architecture normal normal?

NOTE Confidence: 0.7897528715

00:41:29.744 --> 00:41:30.418 You know.

NOTE Confidence: 0.7897528715

00:41:30.418 --> 00:41:31.429 In other words,

NOTE Confidence: 0.7897528715

00:41:31.430 --> 00:41:33.740 sleep efficiency of 86% a little

NOTE Confidence: 0.7897528715

00:41:33.740 --> 00:41:36.303 bit of anyone quite a bit of N3

NOTE Confidence: 0.7897528715

00:41:36.303 --> 00:41:38.539 and RAM and a lot of north two.

NOTE Confidence: 0.7897528715

00:41:38.540 --> 00:41:40.808 I mean everyone knows that but here.

NOTE Confidence: 0.7897528715

00:41:40.810 --> 00:41:42.070 Then I got the idea.

NOTE Confidence: 0.7897528715

00:41:42.070 --> 00:41:42.476 Well,

NOTE Confidence: 0.7897528715

00:41:42.476 --> 00:41:43.694 why don't we,

NOTE Confidence: 0.7897528715

00:41:43.694 --> 00:41:45.724 instead of breaking it into

NOTE Confidence: 0.7897528715

00:41:45.724 --> 00:41:47.538 five stages like this,

NOTE Confidence: 0.7897528715

00:41:47.540 --> 00:41:51.520 we break it into 10 so so I divided the

NOTE Confidence: 0.786139702916667

00:41:51.622 --> 00:41:54.250 total range of RP into 10

NOTE Confidence: 0.786139702916667

00:41:54.250 --> 00:41:57.871 deciles and now I plot instead of

NOTE Confidence: 0.786139702916667

00:41:57.871 --> 00:42:00.110 percent percent in a week time.

NOTE Confidence: 0.786139702916667
00:42:00.110 --> 00:42:02.852 I plot percent of the recording
NOTE Confidence: 0.786139702916667
00:42:02.852 --> 00:42:05.350 time in this very deep sleep.
NOTE Confidence: 0.786139702916667
00:42:05.350 --> 00:42:07.000 Deep sleep oops.
NOTE Confidence: 0.4387083
00:42:10.030 --> 00:42:10.910 How?
NOTE Confidence: 0.525139095
00:42:13.980 --> 00:42:17.068 These two are or. This is deep sleep.
NOTE Confidence: 0.525139095
00:42:17.070 --> 00:42:18.210 This is sort of average.
NOTE Confidence: 0.525139095
00:42:18.210 --> 00:42:21.171 This is light sleep and then it in normal
NOTE Confidence: 0.525139095
00:42:21.171 --> 00:42:23.578 people it trickles down quickly as you
NOTE Confidence: 0.525139095
00:42:23.578 --> 00:42:26.159 get into the very lights not sleep.
NOTE Confidence: 0.525139095
00:42:26.160 --> 00:42:27.816 I mean transitional States
NOTE Confidence: 0.525139095
00:42:27.816 --> 00:42:30.300 and these are the three ranges
NOTE Confidence: 0.525139095
00:42:30.378 --> 00:42:32.558 that are usually called awake.
NOTE Confidence: 0.525139095
00:42:32.560 --> 00:42:34.328 This is drowsy awake.
NOTE Confidence: 0.525139095
00:42:34.328 --> 00:42:36.976 This is drowsy. This is very drowsy,
NOTE Confidence: 0.525139095
00:42:36.976 --> 00:42:38.950 drowsy and this is full wakefulness.
NOTE Confidence: 0.525139095

00:42:38.950 --> 00:42:41.566 So this patient didn't have much
NOTE Confidence: 0.525139095

00:42:41.566 --> 00:42:43.770 full wakefulness of this kind.
NOTE Confidence: 0.525139095

00:42:43.770 --> 00:42:47.010 So that is the the new the what I'm
NOTE Confidence: 0.525139095

00:42:47.010 --> 00:42:49.778 proposing to use as a new architecture,
NOTE Confidence: 0.525139095

00:42:49.780 --> 00:42:51.700 and what I'm hoping to convince
NOTE Confidence: 0.525139095

00:42:51.700 --> 00:42:54.189 you that this is a good way to go.
NOTE Confidence: 0.887856453333333

00:42:56.540 --> 00:42:59.360 So these are two normal people,
NOTE Confidence: 0.887856453333333

00:42:59.360 --> 00:43:02.048 so now of course with this new
NOTE Confidence: 0.887856453333333

00:43:02.050 --> 00:43:04.612 gadget or gizmo I started looking
NOTE Confidence: 0.887856453333333

00:43:04.612 --> 00:43:07.621 at all kinds of people and I
NOTE Confidence: 0.887856453333333

00:43:07.621 --> 00:43:12.960 have 10s of thousands of of PSGS.
NOTE Confidence: 0.887856453333333

00:43:12.960 --> 00:43:15.525 And so I started looking and a lot of
NOTE Confidence: 0.887856453333333

00:43:15.525 --> 00:43:17.958 people of course look normal like this.
NOTE Confidence: 0.887856453333333

00:43:17.960 --> 00:43:21.372 These are two normal people and but
NOTE Confidence: 0.887856453333333

00:43:21.372 --> 00:43:23.658 then you see this these patterns.
NOTE Confidence: 0.887856453333333

00:43:23.660 --> 00:43:27.436 OK, so this is this is a pattern.

NOTE Confidence: 0.887856453333333

00:43:27.440 --> 00:43:28.880 This is another pattern you see.

NOTE Confidence: 0.887856453333333

00:43:28.880 --> 00:43:31.450 This one picks the peak.

NOTE Confidence: 0.887856453333333

00:43:31.450 --> 00:43:34.390 The people currents of air boxes in

NOTE Confidence: 0.887856453333333

00:43:34.390 --> 00:43:37.284 the in the transitional very very

NOTE Confidence: 0.887856453333333

00:43:37.284 --> 00:43:40.868 very light sleep if sleep at all.

NOTE Confidence: 0.887856453333333

00:43:40.870 --> 00:43:42.174 By contrast to this,

NOTE Confidence: 0.887856453333333

00:43:42.174 --> 00:43:44.130 this one has really no peak

NOTE Confidence: 0.887856453333333

00:43:44.199 --> 00:43:45.487 in the sleep range,

NOTE Confidence: 0.887856453333333

00:43:45.490 --> 00:43:47.938 and he has plenty of wakefulness.

NOTE Confidence: 0.887856453333333

00:43:47.940 --> 00:43:50.556 This this fellow has a lot of deep

NOTE Confidence: 0.887856453333333

00:43:50.556 --> 00:43:52.670 sleep just like normal people,

NOTE Confidence: 0.887856453333333

00:43:52.670 --> 00:43:55.500 with very little full wakefulness.

NOTE Confidence: 0.887856453333333

00:43:55.500 --> 00:43:58.517 And this one has both both ways.

NOTE Confidence: 0.887856453333333

00:43:58.520 --> 00:44:00.020 A lot of deep sleep,

NOTE Confidence: 0.887856453333333

00:44:00.020 --> 00:44:02.330 but also a lot of full wakefulness.

NOTE Confidence: 0.887856453333333

00:44:02.330 --> 00:44:06.047 So it struck me that this this
NOTE Confidence: 0.8878564533333333

00:44:06.047 --> 00:44:08.437 four different patterns represent
NOTE Confidence: 0.8878564533333333

00:44:08.437 --> 00:44:10.031 different pathophysiology.
NOTE Confidence: 0.8878564533333333

00:44:10.031 --> 00:44:14.016 Uh, in that this patient.
NOTE Confidence: 0.8878564533333333

00:44:14.020 --> 00:44:18.024 This patient has very little deep sleep.
NOTE Confidence: 0.8878564533333333

00:44:18.030 --> 00:44:20.718 What can that be?
NOTE Confidence: 0.8878564533333333

00:44:20.720 --> 00:44:23.060 That could be because the patient
NOTE Confidence: 0.8878564533333333

00:44:23.060 --> 00:44:25.370 has very low sleep pressure.
NOTE Confidence: 0.8878564533333333

00:44:25.370 --> 00:44:27.386 Or it could be because there is
NOTE Confidence: 0.8878564533333333

00:44:27.386 --> 00:44:29.276 something we can keep waking the
NOTE Confidence: 0.8878564533333333

00:44:29.276 --> 00:44:31.190 patient up every time he falls
NOTE Confidence: 0.8878564533333333

00:44:31.190 --> 00:44:33.134 asleep and preventing him from
NOTE Confidence: 0.8878564533333333

00:44:33.134 --> 00:44:34.698 progressing into deep sleep.
NOTE Confidence: 0.8878564533333333

00:44:34.700 --> 00:44:37.094 So these are the two possibilities
NOTE Confidence: 0.8878564533333333

00:44:37.094 --> 00:44:40.341 for a very low amount in deep in
NOTE Confidence: 0.8878564533333333

00:44:40.341 --> 00:44:42.687 very deep sleep in deep sleep.

NOTE Confidence: 0.8878564533333333
00:44:42.690 --> 00:44:45.138 But if it was a low sleep pressure,
NOTE Confidence: 0.8878564533333333
00:44:45.140 --> 00:44:47.492 why is he having very little
NOTE Confidence: 0.8878564533333333
00:44:47.492 --> 00:44:48.276 full wakefulness?
NOTE Confidence: 0.8878564533333333
00:44:48.280 --> 00:44:48.756 You know,
NOTE Confidence: 0.8878564533333333
00:44:48.756 --> 00:44:51.299 we know that if you have a lot of if
NOTE Confidence: 0.8878564533333333
00:44:51.299 --> 00:44:53.039 you have very low sleep pressure,
NOTE Confidence: 0.8878564533333333
00:44:53.040 --> 00:44:55.360 you would get a lot of full wakefulness.
NOTE Confidence: 0.8878564533333333
00:44:55.360 --> 00:44:57.768 If you have a lot of drowsiness,
NOTE Confidence: 0.8878564533333333
00:44:57.770 --> 00:44:58.710 which would happen here,
NOTE Confidence: 0.8878564533333333
00:44:58.710 --> 00:45:00.785 you can have a lot of a lot in
NOTE Confidence: 0.8878564533333333
00:45:00.785 --> 00:45:02.824 eight and nine, but not in 10.
NOTE Confidence: 0.8878564533333333
00:45:02.824 --> 00:45:04.604 So this pattern would suggest,
NOTE Confidence: 0.8878564533333333
00:45:04.610 --> 00:45:04.993 then,
NOTE Confidence: 0.8878564533333333
00:45:04.993 --> 00:45:07.674 that this is a patient who has
NOTE Confidence: 0.8878564533333333
00:45:07.674 --> 00:45:09.849 pathology that is preventing him
NOTE Confidence: 0.8878564533333333

00:45:09.849 --> 00:45:12.059 from getting into deep sleep,
NOTE Confidence: 0.8878564533333333

00:45:12.060 --> 00:45:14.180 and as a consequence.
NOTE Confidence: 0.8878564533333333

00:45:14.180 --> 00:45:17.054 He's sleep deprived, so this is.
NOTE Confidence: 0.8878564533333333

00:45:17.054 --> 00:45:18.766 This is subject one.
NOTE Confidence: 0.8878564533333333

00:45:18.770 --> 00:45:21.829 This one also has very low amounts.
NOTE Confidence: 0.8878564533333333

00:45:21.830 --> 00:45:24.126 Remember this is 5 and zero is 5.
NOTE Confidence: 0.8878564533333333

00:45:24.130 --> 00:45:26.716 By comparison this is 20 and
NOTE Confidence: 0.8878564533333333

00:45:26.716 --> 00:45:30.304 seven and this is 22 and eight so
NOTE Confidence: 0.8878564533333333

00:45:30.304 --> 00:45:32.950 very very little in deep sleep.
NOTE Confidence: 0.8878564533333333

00:45:32.950 --> 00:45:35.365 But unlike this guy, look at that.
NOTE Confidence: 0.8878564533333333

00:45:35.370 --> 00:45:38.882 He has 2527% in full wakefulness,
NOTE Confidence: 0.8878564533333333

00:45:38.882 --> 00:45:40.947 so that's a different pathophysiology.
NOTE Confidence: 0.8878564533333333

00:45:40.950 --> 00:45:41.614 The low,
NOTE Confidence: 0.8878564533333333

00:45:41.614 --> 00:45:43.938 the low amount of deep sleep here
NOTE Confidence: 0.8878564533333333

00:45:43.938 --> 00:45:46.580 could very well be because of low
NOTE Confidence: 0.8878564533333333

00:45:46.580 --> 00:45:50.810 sleep pressure, such as people say, uh.

NOTE Confidence: 0.887856453333333

00:45:50.810 --> 00:45:53.674 In in with a hyperarousal state or or

NOTE Confidence: 0.887856453333333

00:45:53.674 --> 00:45:56.417 you know they they sleep too much,

NOTE Confidence: 0.887856453333333

00:45:56.420 --> 00:45:58.540 they nap all day and you know they

NOTE Confidence: 0.887856453333333

00:45:58.540 --> 00:46:00.647 have no sleep pressure at night.

NOTE Confidence: 0.887856453333333

00:46:00.650 --> 00:46:03.122 This is the third.

NOTE Confidence: 0.887856453333333

00:46:03.122 --> 00:46:04.408 Type you know,

NOTE Confidence: 0.887856453333333

00:46:04.408 --> 00:46:06.078 like lots of deep sleep,

NOTE Confidence: 0.887856453333333

00:46:06.080 --> 00:46:09.139 but he doesn't manage to get some

NOTE Confidence: 0.887856453333333

00:46:09.139 --> 00:46:11.620 full wakefulness like the normal people.

NOTE Confidence: 0.887856453333333

00:46:11.620 --> 00:46:12.820 In other words,

NOTE Confidence: 0.887856453333333

00:46:12.820 --> 00:46:16.936 he didn't really completely restore himself,

NOTE Confidence: 0.887856453333333

00:46:16.940 --> 00:46:18.184 and so,

NOTE Confidence: 0.887856453333333

00:46:18.184 --> 00:46:22.538 but so the both here are low.

NOTE Confidence: 0.511799

00:46:22.540 --> 00:46:26.320 One low and one high, one high and one low.

NOTE Confidence: 0.511799

00:46:26.320 --> 00:46:28.749 And here both of them are high,

NOTE Confidence: 0.511799

00:46:28.750 --> 00:46:31.835 so this suggests again speculation
NOTE Confidence: 0.511799

00:46:31.835 --> 00:46:36.179 that this patient is his deep sleep.
NOTE Confidence: 0.511799

00:46:36.180 --> 00:46:38.545 At some point in the night completely
NOTE Confidence: 0.511799

00:46:38.545 --> 00:46:40.615 satisfies his sleep needs and he
NOTE Confidence: 0.511799

00:46:40.615 --> 00:46:42.888 spends the rest of the night a week.
NOTE Confidence: 0.511799

00:46:42.890 --> 00:46:45.298 Now this is very different from this,
NOTE Confidence: 0.511799

00:46:45.300 --> 00:46:47.600 although both of them have
NOTE Confidence: 0.511799

00:46:47.600 --> 00:46:48.980 excessive full wakefulness,
NOTE Confidence: 0.511799

00:46:48.980 --> 00:46:52.760 so I decided then to make a schemata to
NOTE Confidence: 0.511799

00:46:52.760 --> 00:46:56.118 break break these patterns into discrete
NOTE Confidence: 0.511799

00:46:56.118 --> 00:47:00.180 phenotypes that we can use to then
NOTE Confidence: 0.511799

00:47:00.180 --> 00:47:04.768 compare patients outcomes and disease.
NOTE Confidence: 0.511799

00:47:04.770 --> 00:47:06.366 And before I get into that,
NOTE Confidence: 0.511799

00:47:06.370 --> 00:47:09.370 I just want to show you the relation
NOTE Confidence: 0.511799

00:47:09.370 --> 00:47:12.238 between the the metrics we used to
NOTE Confidence: 0.511799

00:47:12.238 --> 00:47:18.610 indicate levels of sleep and and so here.

NOTE Confidence: 0.511799
00:47:18.610 --> 00:47:21.634 This is what we call transitional sleeper
NOTE Confidence: 0.511799
00:47:21.634 --> 00:47:24.300 or virtually light sleep one and 111.7.
NOTE Confidence: 0.511799
00:47:24.300 --> 00:47:25.740 This is north one.
NOTE Confidence: 0.511799
00:47:25.740 --> 00:47:28.844 You can see there is very little correlation.
NOTE Confidence: 0.511799
00:47:28.850 --> 00:47:30.962 Again, this is what we called
NOTE Confidence: 0.511799
00:47:30.962 --> 00:47:32.660 deep sleep less than .5.
NOTE Confidence: 0.511799
00:47:32.660 --> 00:47:35.450 Here is not percent of time in stage three.
NOTE Confidence: 0.511799
00:47:35.450 --> 00:47:37.982 Again, very significant, but we have
NOTE Confidence: 0.511799
00:47:37.982 --> 00:47:41.289 5000 people so but it's very poor here.
NOTE Confidence: 0.511799
00:47:41.290 --> 00:47:44.536 Is there wake epochs in full
NOTE Confidence: 0.511799
00:47:44.536 --> 00:47:47.439 wakefulness versus Epoc scored a week?
NOTE Confidence: 0.511799
00:47:47.440 --> 00:47:48.748 And what is important?
NOTE Confidence: 0.511799
00:47:48.748 --> 00:47:51.468 Here is that you can have someone who
NOTE Confidence: 0.511799
00:47:51.468 --> 00:47:54.196 has virtually no deep sleep by the RP,
NOTE Confidence: 0.511799
00:47:54.200 --> 00:47:56.980 but he can have 30% awake time.
NOTE Confidence: 0.511799

00:47:56.980 --> 00:47:59.170 In other words, sleep efficiency of 70.
NOTE Confidence: 0.511799

00:47:59.170 --> 00:48:01.150 Or you can have equal amount,
NOTE Confidence: 0.511799

00:48:01.150 --> 00:48:03.665 meaning all the airports are
NOTE Confidence: 0.511799

00:48:03.665 --> 00:48:05.174 in full wakefulness.
NOTE Confidence: 0.511799

00:48:05.180 --> 00:48:07.028 So here now are the nine.
NOTE Confidence: 0.511799

00:48:07.030 --> 00:48:08.011 The nine patterns.
NOTE Confidence: 0.511799

00:48:08.011 --> 00:48:11.210 This is the one I showed you before type,
NOTE Confidence: 0.511799

00:48:11.210 --> 00:48:13.400 So what I did is.
NOTE Confidence: 0.511799

00:48:13.400 --> 00:48:15.507 Measure the percent of time in deep
NOTE Confidence: 0.511799

00:48:15.507 --> 00:48:18.042 sleep and the percent of time in full
NOTE Confidence: 0.511799

00:48:18.042 --> 00:48:20.170 wakefulness and put them on a scale,
NOTE Confidence: 0.511799

00:48:20.170 --> 00:48:22.357 each one on a scale of one to three,
NOTE Confidence: 0.511799

00:48:22.360 --> 00:48:25.125 one being in the lowest
NOTE Confidence: 0.511799

00:48:25.125 --> 00:48:27.890 quartile of the 5000 patients,
NOTE Confidence: 0.511799

00:48:27.890 --> 00:48:30.165 and three being in the highest quartile.
NOTE Confidence: 0.511799

00:48:30.170 --> 00:48:32.066 So when we have one one,

NOTE Confidence: 0.511799
00:48:32.070 --> 00:48:34.947 it means one refers to the amount
NOTE Confidence: 0.511799
00:48:34.947 --> 00:48:37.468 relative amount in deep sleep and
NOTE Confidence: 0.511799
00:48:37.468 --> 00:48:40.289 the 2nd digit refers to the relative
NOTE Confidence: 0.511799
00:48:40.290 --> 00:48:43.634 SO11 means is low in both of them.
NOTE Confidence: 0.511799
00:48:43.640 --> 00:48:46.898 1/2 he's in low low end and deep sleep,
NOTE Confidence: 0.511799
00:48:46.900 --> 00:48:49.180 but has his in the interquartile
NOTE Confidence: 0.511799
00:48:49.180 --> 00:48:51.720 range in in full wakefulness.
NOTE Confidence: 0.511799
00:48:51.720 --> 00:48:54.422 This is in the highest quartile in
NOTE Confidence: 0.511799
00:48:54.422 --> 00:48:56.560 full wakefulness, but also in one,
NOTE Confidence: 0.511799
00:48:56.560 --> 00:48:58.260 and it goes like this,
NOTE Confidence: 0.511799
00:48:58.260 --> 00:49:00.438 so this is 3/1 a lot of deep sleep
NOTE Confidence: 0.511799
00:49:00.438 --> 00:49:02.587 and very little full wakefulness.
NOTE Confidence: 0.511799
00:49:02.590 --> 00:49:05.187 This is 3/3 a lot of both.
NOTE Confidence: 0.511799
00:49:05.190 --> 00:49:07.178 So so when you see the number,
NOTE Confidence: 0.511799
00:49:07.180 --> 00:49:10.150 you can actually visualize the histogram,
NOTE Confidence: 0.511799

00:49:10.150 --> 00:49:11.870 and you can actually visualize
NOTE Confidence: 0.511799

00:49:11.870 --> 00:49:13.246 the quality of sleep.
NOTE Confidence: 0.511799

00:49:13.250 --> 00:49:16.015 In this patient was happening to him.
NOTE Confidence: 0.511799

00:49:16.020 --> 00:49:17.840 So this is the second last slide,
NOTE Confidence: 0.511799

00:49:17.840 --> 00:49:20.129 but it's going to take some time.
NOTE Confidence: 0.511799

00:49:20.130 --> 00:49:23.238 This is now how often these
NOTE Confidence: 0.511799

00:49:23.238 --> 00:49:26.129 different nine patterns occur in
NOTE Confidence: 0.511799

00:49:26.129 --> 00:49:30.070 different clinical disorders, so.
NOTE Confidence: 0.511799

00:49:30.070 --> 00:49:31.925 So don't look at all the numbers.
NOTE Confidence: 0.511799

00:49:31.930 --> 00:49:34.660 I you know the significant values
NOTE Confidence: 0.511799

00:49:34.660 --> 00:49:37.690 are indicated by by these digits.
NOTE Confidence: 0.511799

00:49:37.690 --> 00:49:41.029 Mild OSA doesn't differ from no disease,
NOTE Confidence: 0.511799

00:49:41.030 --> 00:49:43.640 no disease, meaning noisy or PLM.
NOTE Confidence: 0.511799

00:49:43.640 --> 00:49:45.780 So by analysis of variance,
NOTE Confidence: 0.790117853571429

00:49:45.780 --> 00:49:48.538 mild OSA, the distribution of patterns is
NOTE Confidence: 0.790117853571429

00:49:48.538 --> 00:49:51.389 very similar to people with no disease,

NOTE Confidence: 0.790117853571429
00:49:51.390 --> 00:49:52.671 hence probably needed.
NOTE Confidence: 0.790117853571429
00:49:52.671 --> 00:49:55.349 We shouldn't be treating them moderate
NOTE Confidence: 0.790117853571429
00:49:55.349 --> 00:49:58.583 is also very little different or
NOTE Confidence: 0.790117853571429
00:49:58.583 --> 00:50:01.220 those significant from no disease.
NOTE Confidence: 0.790117853571429
00:50:01.220 --> 00:50:04.436 Now we get into severe and very severe,
NOTE Confidence: 0.790117853571429
00:50:04.440 --> 00:50:07.300 and these are the significant
NOTE Confidence: 0.790117853571429
00:50:07.300 --> 00:50:10.720 differences from the people with no AC
NOTE Confidence: 0.790117853571429
00:50:10.720 --> 00:50:14.352 and these are 1/2 and 1112 and 1/3 zip.
NOTE Confidence: 0.790117853571429
00:50:14.352 --> 00:50:16.572 Adding them up here in the very
NOTE Confidence: 0.790117853571429
00:50:16.572 --> 00:50:19.120 severe very severe means more than 50.
NOTE Confidence: 0.790117853571429
00:50:19.120 --> 00:50:22.905 Hi, we have 4060 more than 60%
NOTE Confidence: 0.790117853571429
00:50:22.905 --> 00:50:26.664 of the of the patients have this
NOTE Confidence: 0.790117853571429
00:50:26.664 --> 00:50:30.624 pattern with 112 and 1/3.
NOTE Confidence: 0.790117853571429
00:50:30.630 --> 00:50:33.360 So these patterns are are are
NOTE Confidence: 0.790117853571429
00:50:33.360 --> 00:50:35.172 the characteristic of severe's
NOTE Confidence: 0.790117853571429

00:50:35.172 --> 00:50:36.940 of severe sleep apnea.
NOTE Confidence: 0.790117853571429

00:50:36.940 --> 00:50:39.410 Insomnia with normal sleep duration.
NOTE Confidence: 0.790117853571429

00:50:39.410 --> 00:50:42.190 There is nothing significantly different.
NOTE Confidence: 0.790117853571429

00:50:42.190 --> 00:50:44.530 A short sleep duration.
NOTE Confidence: 0.790117853571429

00:50:44.530 --> 00:50:47.455 There are two dominant patterns.
NOTE Confidence: 0.790117853571429

00:50:47.460 --> 00:50:48.555 One is 1/3.
NOTE Confidence: 0.790117853571429

00:50:48.555 --> 00:50:51.110 Which is the one in the top
NOTE Confidence: 0.790117853571429

00:50:51.206 --> 00:50:53.746 right corner and one is 2/3,
NOTE Confidence: 0.790117853571429

00:50:53.746 --> 00:50:55.870 which is the one below it.
NOTE Confidence: 0.790117853571429

00:50:55.870 --> 00:50:58.132 The difference is that this one
NOTE Confidence: 0.790117853571429

00:50:58.132 --> 00:51:00.150 has very little deep sleep.
NOTE Confidence: 0.790117853571429

00:51:00.150 --> 00:51:03.282 This one has an average amount of deep sleep,
NOTE Confidence: 0.790117853571429

00:51:03.290 --> 00:51:05.880 so there are two types of of
NOTE Confidence: 0.790117853571429

00:51:05.880 --> 00:51:08.224 our patterns and insomnia and
NOTE Confidence: 0.790117853571429

00:51:08.224 --> 00:51:10.524 insomnia with obstructive sleep
NOTE Confidence: 0.790117853571429

00:51:10.524 --> 00:51:13.490 apnea is significant only in 1/3,

NOTE Confidence: 0.790117853571429

00:51:13.490 --> 00:51:16.528 so now here are the patterns is

NOTE Confidence: 0.790117853571429

00:51:16.528 --> 00:51:19.386 just to remind you this is this

NOTE Confidence: 0.790117853571429

00:51:19.386 --> 00:51:21.731 is one one this is 1/2.

NOTE Confidence: 0.790117853571429

00:51:21.731 --> 00:51:24.650 This is 1/3 and this is 3,

NOTE Confidence: 0.790117853571429

00:51:24.650 --> 00:51:27.838 three or two three.

NOTE Confidence: 0.790117853571429

00:51:27.840 --> 00:51:30.626 Now, in some ways also looked at

NOTE Confidence: 0.790117853571429

00:51:30.626 --> 00:51:34.313 quality of life and DSS, so type 11.

NOTE Confidence: 0.790117853571429

00:51:34.313 --> 00:51:37.799 It's primarily seen in severe OSA,

NOTE Confidence: 0.790117853571429

00:51:37.800 --> 00:51:41.356 but sometimes it occurs in in people

NOTE Confidence: 0.790117853571429

00:51:41.356 --> 00:51:42.372 with noisy.

NOTE Confidence: 0.790117853571429

00:51:42.380 --> 00:51:45.145 It has the highest ESS and the

NOTE Confidence: 0.790117853571429

00:51:45.145 --> 00:51:48.042 lowest quality of life scores SF 36.

NOTE Confidence: 0.790117853571429

00:51:48.042 --> 00:51:50.569 And it has a high or pee.

NOTE Confidence: 0.790117853571429

00:51:50.570 --> 00:51:53.458 I told you you don't get into very

NOTE Confidence: 0.790117853571429

00:51:53.458 --> 00:51:57.208 high hiz unless unless you have high or pee.

NOTE Confidence: 0.790117853571429

00:51:57.210 --> 00:52:00.262 In other words, you have a central
NOTE Confidence: 0.790117853571429

00:52:00.262 --> 00:52:02.639 problem in keeping sleep tight.
NOTE Confidence: 0.790117853571429

00:52:02.640 --> 00:52:05.010 This second one, one in two,
NOTE Confidence: 0.790117853571429

00:52:05.010 --> 00:52:07.370 also primarily seen in OSA.
NOTE Confidence: 0.790117853571429

00:52:07.370 --> 00:52:08.514 You don't see well.
NOTE Confidence: 0.790117853571429

00:52:08.514 --> 00:52:11.259 You see quite a bit in normal people,
NOTE Confidence: 0.790117853571429

00:52:11.260 --> 00:52:14.100 but this is 25% mostly seen in severe
NOTE Confidence: 0.790117853571429

00:52:14.100 --> 00:52:17.118 OSA is also associated with high SS
NOTE Confidence: 0.790117853571429

00:52:17.118 --> 00:52:19.830 and low quality quality of life,
NOTE Confidence: 0.790117853571429

00:52:19.830 --> 00:52:21.426 but not as bad as this.
NOTE Confidence: 0.790117853571429

00:52:21.430 --> 00:52:25.168 And it also has high RPM.
NOTE Confidence: 0.790117853571429

00:52:25.170 --> 00:52:29.554 The third one, which is 1/3 this one.
NOTE Confidence: 0.790117853571429

00:52:29.560 --> 00:52:32.610 Primarily seen in severe OSA
NOTE Confidence: 0.790117853571429

00:52:32.610 --> 00:52:35.660 insomnia with short sleep duration
NOTE Confidence: 0.790117853571429

00:52:35.759 --> 00:52:37.887 and insomnia with OSA.
NOTE Confidence: 0.790117853571429

00:52:37.890 --> 00:52:40.716 So these are the three times

NOTE Confidence: 0.790117853571429

00:52:40.716 --> 00:52:42.576 that they happen and.

NOTE Confidence: 0.790117853571429

00:52:42.576 --> 00:52:43.468 It's at,

NOTE Confidence: 0.790117853571429

00:52:43.468 --> 00:52:46.144 there's asociated with very low quality

NOTE Confidence: 0.790117853571429

00:52:46.144 --> 00:52:49.142 of life scores, high risk of blood,

NOTE Confidence: 0.790117853571429

00:52:49.142 --> 00:52:51.465 high blood pressure, and low survival.

NOTE Confidence: 0.790117853571429

00:52:51.465 --> 00:52:53.835 In addition to these are not,

NOTE Confidence: 0.790117853571429

00:52:53.840 --> 00:52:56.619 but this one is. And very high.

NOTE Confidence: 0.790117853571429

00:52:56.620 --> 00:52:58.570 This is the highest or P9.

NOTE Confidence: 0.790117853571429

00:52:58.570 --> 00:53:00.304 In other words,

NOTE Confidence: 0.790117853571429

00:53:00.304 --> 00:53:03.059 the highest highest slowness of

NOTE Confidence: 0.790117853571429

00:53:03.059 --> 00:53:06.257 progression to deep sleep and more

NOTE Confidence: 0.790117853571429

00:53:06.257 --> 00:53:08.760 likelihood of sleep fragmentation.

NOTE Confidence: 0.790117853571429

00:53:08.760 --> 00:53:10.740 But they are not sleepy, they are.

NOTE Confidence: 0.790117853571429

00:53:10.740 --> 00:53:12.540 They are among the lowest sleepy.

NOTE Confidence: 0.790117853571429

00:53:12.540 --> 00:53:13.380 And finally,

NOTE Confidence: 0.790117853571429

00:53:13.380 --> 00:53:15.900 this one is primarily seen in
NOTE Confidence: 0.790117853571429

00:53:15.900 --> 00:53:18.476 insomnia with short sleep duration
NOTE Confidence: 0.790117853571429

00:53:18.476 --> 00:53:20.129 with source liberation.
NOTE Confidence: 0.790117853571429

00:53:20.130 --> 00:53:23.118 It also has low ESS and we would expect
NOTE Confidence: 0.790117853571429

00:53:23.118 --> 00:53:25.719 that from the excessive amount of.
NOTE Confidence: 0.790117853571429

00:53:25.720 --> 00:53:27.992 Of a full wakefulness.
NOTE Confidence: 0.790117853571429

00:53:27.992 --> 00:53:31.400 But it says normal quality of
NOTE Confidence: 0.776432747083333

00:53:31.517 --> 00:53:34.069 life scores. No increased risk
NOTE Confidence: 0.776432747083333

00:53:34.069 --> 00:53:36.134 of blood pressure or reduced
NOTE Confidence: 0.776432747083333

00:53:36.134 --> 00:53:38.150 survival and has a normal RP.
NOTE Confidence: 0.776432747083333

00:53:38.150 --> 00:53:40.394 So clearly these two are different
NOTE Confidence: 0.776432747083333

00:53:40.394 --> 00:53:42.507 phenotypes even though they are lumped
NOTE Confidence: 0.776432747083333

00:53:42.507 --> 00:53:44.723 to get both of them would be called
NOTE Confidence: 0.776432747083333

00:53:44.790 --> 00:53:46.998 because they have this have insomnia
NOTE Confidence: 0.776432747083333

00:53:46.998 --> 00:53:48.900 symptoms that meet the criteria
NOTE Confidence: 0.776432747083333

00:53:48.900 --> 00:53:51.270 and they have short sleep duration

NOTE Confidence: 0.776432747083333
00:53:51.270 --> 00:53:53.786 so they get all lumped in this.
NOTE Confidence: 0.776432747083333
00:53:53.790 --> 00:53:55.165 But we realized that there
NOTE Confidence: 0.776432747083333
00:53:55.165 --> 00:53:56.265 are two patterns here.
NOTE Confidence: 0.776432747083333
00:53:56.270 --> 00:53:58.293 One of them is terrible and the
NOTE Confidence: 0.776432747083333
00:53:58.293 --> 00:53:59.960 other one looks pretty good,
NOTE Confidence: 0.776432747083333
00:53:59.960 --> 00:54:03.137 so that maybe maybe we can start looking at.
NOTE Confidence: 0.776432747083333
00:54:03.140 --> 00:54:06.788 These two types within ISD and see whether
NOTE Confidence: 0.776432747083333
00:54:06.788 --> 00:54:09.525 they respond to different treatments
NOTE Confidence: 0.776432747083333
00:54:09.525 --> 00:54:12.425 or they have different outcomes.
NOTE Confidence: 0.776432747083333
00:54:12.430 --> 00:54:13.161 Finally.
NOTE Confidence: 0.776432747083333
00:54:13.161 --> 00:54:16.816 Uh, as I mentioned before,
NOTE Confidence: 0.776432747083333
00:54:16.820 --> 00:54:22.832 even people with noisy or or or or or
NOTE Confidence: 0.776432747083333
00:54:22.832 --> 00:54:26.125 anything that we can see on the PSU
NOTE Confidence: 0.776432747083333
00:54:26.125 --> 00:54:30.258 takes 10% have 1/2 and 8% have 1/3.
NOTE Confidence: 0.776432747083333
00:54:30.260 --> 00:54:31.760 So what do we do?
NOTE Confidence: 0.776432747083333

00:54:31.760 --> 00:54:32.354 Is this?
NOTE Confidence: 0.776432747083333

00:54:32.354 --> 00:54:34.730 I mean these are probably the patients we
NOTE Confidence: 0.776432747083333

00:54:34.789 --> 00:54:37.214 get sometimes complaining of excessive
NOTE Confidence: 0.776432747083333

00:54:37.214 --> 00:54:38.820 somnolence or non restorative sleep,
NOTE Confidence: 0.776432747083333

00:54:38.820 --> 00:54:41.077 and we do a sleep study and it's
NOTE Confidence: 0.776432747083333

00:54:41.077 --> 00:54:42.897 normal and we tell them go home.
NOTE Confidence: 0.776432747083333

00:54:42.900 --> 00:54:44.988 You know it's just all in your head.
NOTE Confidence: 0.776432747083333

00:54:44.990 --> 00:54:45.941 But in reality,
NOTE Confidence: 0.776432747083333

00:54:45.941 --> 00:54:47.526 now we actually know the
NOTE Confidence: 0.776432747083333

00:54:47.526 --> 00:54:49.090 explanation of these patterns.
NOTE Confidence: 0.776432747083333

00:54:49.090 --> 00:54:51.916 We when we get people like this with with
NOTE Confidence: 0.776432747083333

00:54:51.916 --> 00:54:54.645 these three types and they have symptoms,
NOTE Confidence: 0.776432747083333

00:54:54.650 --> 00:54:57.596 then we should really consider that
NOTE Confidence: 0.776432747083333

00:54:57.596 --> 00:55:00.090 they have something that's either
NOTE Confidence: 0.776432747083333

00:55:00.090 --> 00:55:02.754 interrupting their sleep that we don't
NOTE Confidence: 0.776432747083333

00:55:02.754 --> 00:55:05.909 see on the PSG from other organs,

NOTE Confidence: 0.776432747083333
00:55:05.910 --> 00:55:08.270 or that they have a hyper arousal state.
NOTE Confidence: 0.776432747083333
00:55:08.270 --> 00:55:10.448 But they're not complaining about insomnia,
NOTE Confidence: 0.776432747083333
00:55:10.450 --> 00:55:12.555 and we should pursue them
NOTE Confidence: 0.776432747083333
00:55:12.555 --> 00:55:14.239 a little more vigorously.
NOTE Confidence: 0.776432747083333
00:55:14.240 --> 00:55:15.984 Finally, I just want to show you that.
NOTE Confidence: 0.776432747083333
00:55:15.990 --> 00:55:17.103 These are four.
NOTE Confidence: 0.776432747083333
00:55:17.103 --> 00:55:19.329 The four patients for subjects I
NOTE Confidence: 0.776432747083333
00:55:19.329 --> 00:55:22.362 sold you from at the very beginning
NOTE Confidence: 0.776432747083333
00:55:22.362 --> 00:55:24.902 that they're all coming from
NOTE Confidence: 0.776432747083333
00:55:24.902 --> 00:55:27.727 people with no AC or or insomnia
NOTE Confidence: 0.776432747083333
00:55:27.730 --> 00:55:30.117 and it just shows you that these
NOTE Confidence: 0.776432747083333
00:55:30.117 --> 00:55:32.323 people happen in people with with
NOTE Confidence: 0.776432747083333
00:55:32.323 --> 00:55:34.549 with no complaints but not not.
NOTE Confidence: 0.776432747083333
00:55:34.550 --> 00:55:36.450 They may have excessive sleepiness,
NOTE Confidence: 0.776432747083333
00:55:36.450 --> 00:55:40.300 but with nothing on the PSG showing
NOTE Confidence: 0.776432747083333

00:55:40.300 --> 00:55:43.270 an that we should pursue them.
NOTE Confidence: 0.776432747083333

00:55:43.270 --> 00:55:44.908 And this is just to confirm
NOTE Confidence: 0.776432747083333

00:55:44.908 --> 00:55:46.000 to you these people.
NOTE Confidence: 0.776432747083333

00:55:46.000 --> 00:55:48.170 All have normal sleep architecture
NOTE Confidence: 0.776432747083333

00:55:48.170 --> 00:55:51.659 by the by the regular stuff and it
NOTE Confidence: 0.776432747083333

00:55:51.659 --> 00:55:54.125 shows you the difference in their
NOTE Confidence: 0.776432747083333

00:55:54.125 --> 00:55:56.824 health outcomes and the last.
NOTE Confidence: 0.776432747083333

00:55:56.824 --> 00:56:00.520 The last thing we're looking at is
NOTE Confidence: 0.776432747083333

00:56:00.638 --> 00:56:04.053 whether these patterns can help
NOTE Confidence: 0.776432747083333

00:56:04.053 --> 00:56:07.468 us understand response to CPAP
NOTE Confidence: 0.776432747083333

00:56:07.579 --> 00:56:09.780 so so so this is type one.
NOTE Confidence: 0.776432747083333

00:56:09.780 --> 00:56:12.980 This is the last slide type one you see here.
NOTE Confidence: 0.776432747083333

00:56:12.980 --> 00:56:15.182 Type one very little here and
NOTE Confidence: 0.776432747083333

00:56:15.182 --> 00:56:16.283 very little here.
NOTE Confidence: 0.776432747083333

00:56:16.290 --> 00:56:19.280 And when we put them on CPAP you can see
NOTE Confidence: 0.776432747083333

00:56:19.363 --> 00:56:22.506 the left shift now getting towards normal.

NOTE Confidence: 0.776432747083333
00:56:22.510 --> 00:56:26.248 And the RP goes from one point.
NOTE Confidence: 0.776432747083333
00:56:26.250 --> 00:56:26.914 132.88.
NOTE Confidence: 0.776432747083333
00:56:26.914 --> 00:56:31.540 Sleep efficiency doesn't change, but.
NOTE Confidence: 0.776432747083333
00:56:31.540 --> 00:56:33.346 Because the sum of these three is
NOTE Confidence: 0.776432747083333
00:56:33.346 --> 00:56:35.507 the same as the sum of these three.
NOTE Confidence: 0.776432747083333
00:56:35.510 --> 00:56:38.720 But let's sleep depth improves.
NOTE Confidence: 0.776432747083333
00:56:38.720 --> 00:56:40.224 Here is type 1/2.
NOTE Confidence: 0.776432747083333
00:56:40.224 --> 00:56:43.240 Again, nothing here but modest amount here,
NOTE Confidence: 0.776432747083333
00:56:43.240 --> 00:56:45.376 and they also respond very nicely
NOTE Confidence: 0.776432747083333
00:56:45.376 --> 00:56:48.470 to see PAP if they have severe OSA.
NOTE Confidence: 0.776432747083333
00:56:48.470 --> 00:56:50.190 This is Type 3,
NOTE Confidence: 0.776432747083333
00:56:50.190 --> 00:56:51.050 the insomniac,
NOTE Confidence: 0.776432747083333
00:56:51.050 --> 00:56:54.620 or 36% of patients in this group
NOTE Confidence: 0.776432747083333
00:56:54.620 --> 00:56:56.150 of 200 patients
NOTE Confidence: 0.804955646
00:56:56.150 --> 00:56:59.470 had this type and when we put them on C.
NOTE Confidence: 0.804955646

00:56:59.470 --> 00:57:01.606 Pap, what you see happens is there is.
NOTE Confidence: 0.804955646

00:57:01.610 --> 00:57:04.088 Some improvement here 'cause you might be
NOTE Confidence: 0.804955646

00:57:04.088 --> 00:57:06.927 the OSA was just cutting or cutting short
NOTE Confidence: 0.804955646

00:57:06.927 --> 00:57:09.741 the amount of time in this and then when
NOTE Confidence: 0.804955646

00:57:09.741 --> 00:57:12.630 we put them on C PAP they went up a bit,
NOTE Confidence: 0.804955646

00:57:12.630 --> 00:57:15.781 but the insomnia didn't go away and
NOTE Confidence: 0.804955646

00:57:15.781 --> 00:57:18.367 these are people that have normal
NOTE Confidence: 0.804955646

00:57:18.367 --> 00:57:21.249 pattern before CPAP and nothing happens.
NOTE Confidence: 0.804955646

00:57:21.250 --> 00:57:23.847 Use either or P if anything actually
NOTE Confidence: 0.804955646

00:57:23.847 --> 00:57:26.840 went down. Sleep is less deep and
NOTE Confidence: 0.804955646

00:57:26.840 --> 00:57:29.090 their sleep efficiency went down.
NOTE Confidence: 0.804955646

00:57:29.090 --> 00:57:31.855 So we are now looking into whether.
NOTE Confidence: 0.804955646

00:57:31.860 --> 00:57:34.970 Improvement on sleep as identified
NOTE Confidence: 0.804955646

00:57:34.970 --> 00:57:36.836 by this pattern.
NOTE Confidence: 0.804955646

00:57:36.840 --> 00:57:38.212 Also, will predict compliance
NOTE Confidence: 0.804955646

00:57:38.212 --> 00:57:40.910 with C PAP and we're not done yet.

NOTE Confidence: 0.804955646
00:57:40.910 --> 00:57:42.920 But it looks very promising.
NOTE Confidence: 0.804955646
00:57:42.920 --> 00:57:44.828 Thank you very much.
NOTE Confidence: 0.804955646
00:57:44.828 --> 00:57:46.259 And any questions?
NOTE Confidence: 0.804955646
00:57:46.260 --> 00:57:47.807 I hope I didn't go too long.
NOTE Confidence: 0.962824538
00:57:50.100 --> 00:57:51.340 What do I do now?
NOTE Confidence: 0.760716701428572
00:57:52.300 --> 00:57:54.414 Oh, hi Maggie, that was wonderful talk.
NOTE Confidence: 0.760716701428572
00:57:54.420 --> 00:57:58.576 Thank you very much for giving us a look
NOTE Confidence: 0.760716701428572
00:57:58.576 --> 00:58:00.876 at this amazing work that you've done
NOTE Confidence: 0.760716701428572
00:58:00.880 --> 00:58:03.616 and there we are almost out of time.
NOTE Confidence: 0.760716701428572
00:58:03.620 --> 00:58:05.681 We have a couple of minutes for a few
NOTE Confidence: 0.760716701428572
00:58:05.681 --> 00:58:07.429 questions and so I'll just take some
NOTE Confidence: 0.760716701428572
00:58:07.429 --> 00:58:09.315 questions from the chat and Doctor Eric
NOTE Confidence: 0.760716701428572
00:58:09.315 --> 00:58:11.780 Heckman is asking whether you looked at
NOTE Confidence: 0.760716701428572
00:58:11.780 --> 00:58:14.860 or P and CSI in idiopathic hypersomnia
NOTE Confidence: 0.760716701428572
00:58:14.947 --> 00:58:17.737 patients and whether the numbers.
NOTE Confidence: 0.760716701428572

00:58:17.740 --> 00:58:20.390 In what patients idiopathic
NOTE Confidence: 0.760716701428572

00:58:20.390 --> 00:58:23.520 hypersomnia patients? No,
NOTE Confidence: 0.874319843333333

00:58:23.550 --> 00:58:25.244 no I have. I have several of
NOTE Confidence: 0.874319843333333

00:58:25.244 --> 00:58:27.003 them and but there's no question
NOTE Confidence: 0.874319843333333

00:58:27.003 --> 00:58:30.960 that they're going to be 31.
NOTE Confidence: 0.874319843333333

00:58:30.960 --> 00:58:33.462 Or even yeah, or even just
NOTE Confidence: 0.874319843333333

00:58:33.462 --> 00:58:35.130 continuously in deep sleep.
NOTE Confidence: 0.874319843333333

00:58:35.130 --> 00:58:37.090 I have I. I studied five of them
NOTE Confidence: 0.874319843333333

00:58:37.090 --> 00:58:39.226 in the original or the paper and
NOTE Confidence: 0.874319843333333

00:58:39.226 --> 00:58:41.180 they they were just like that.
NOTE Confidence: 0.874319843333333

00:58:41.180 --> 00:58:42.505 You know they had very
NOTE Confidence: 0.874319843333333

00:58:42.505 --> 00:58:43.565 low or peace throughout,
NOTE Confidence: 0.874319843333333

00:58:43.570 --> 00:58:46.105 but they didn't get enough
NOTE Confidence: 0.874319843333333

00:58:46.105 --> 00:58:48.133 time to recover completely.
NOTE Confidence: 0.77401199368421

00:58:49.740 --> 00:58:52.624 Uhm and Doctor Hilbert from Yale is
NOTE Confidence: 0.77401199368421

00:58:52.624 --> 00:58:55.839 asking whether or P is stable within a

NOTE Confidence: 0.77401199368421
00:58:55.839 --> 00:58:58.188 patient from 9 tonight. And so simple,
NOTE Confidence: 0.764057965454545
00:58:58.200 --> 00:58:59.885 yeah, well, you would expect
NOTE Confidence: 0.764057965454545
00:58:59.885 --> 00:59:01.920 that it would vary a bit,
NOTE Confidence: 0.764057965454545
00:59:01.920 --> 00:59:04.410 because because you know the amount
NOTE Confidence: 0.764057965454545
00:59:04.410 --> 00:59:07.351 of sleep pressure that you have at any
NOTE Confidence: 0.764057965454545
00:59:07.351 --> 00:59:10.157 given night can vary a lot by not a lot,
NOTE Confidence: 0.764057965454545
00:59:10.160 --> 00:59:12.232 but can vary depending on what you were
NOTE Confidence: 0.764057965454545
00:59:12.232 --> 00:59:14.506 doing the last few days or the last night.
NOTE Confidence: 0.764057965454545
00:59:14.510 --> 00:59:16.860 Alcohol and and all that.
NOTE Confidence: 0.764057965454545
00:59:16.860 --> 00:59:20.424 So it does vary and we do have Amy.
NOTE Confidence: 0.764057965454545
00:59:20.430 --> 00:59:24.846 Aimee Bender, who who works uh with us,
NOTE Confidence: 0.764057965454545
00:59:24.850 --> 00:59:26.910 not with me directly,
NOTE Confidence: 0.764057965454545
00:59:26.910 --> 00:59:30.416 but with the company. She just ran.
NOTE Confidence: 0.764057965454545
00:59:30.416 --> 00:59:33.308 They have this prodigy system and
NOTE Confidence: 0.764057965454545
00:59:33.308 --> 00:59:36.717 she restrained 20 normal subjects.
NOTE Confidence: 0.764057965454545

00:59:36.720 --> 00:59:38.268 20 consecutive nights.
NOTE Confidence: 0.764057965454545

00:59:38.268 --> 00:59:42.411 OK, each one ran 20 nights to look at
NOTE Confidence: 0.764057965454545

00:59:42.411 --> 00:59:44.840 this day-to-day variability in RP and we
NOTE Confidence: 0.764057965454545

00:59:44.908 --> 00:59:47.477 do have some earlier studies that also
NOTE Confidence: 0.764057965454545

00:59:47.477 --> 00:59:50.008 show that there is some variability,
NOTE Confidence: 0.764057965454545

00:59:50.010 --> 00:59:51.753 particularly in in,
NOTE Confidence: 0.764057965454545

00:59:51.753 --> 00:59:55.820 in in metrics that are that should
NOTE Confidence: 0.764057965454545

00:59:55.935 --> 00:59:58.647 be affected by sleep depth such
NOTE Confidence: 0.764057965454545

00:59:58.647 --> 01:00:01.104 as OR P in full wakefulness.
NOTE Confidence: 0.764057965454545

01:00:01.104 --> 01:00:03.036 And you know how much shift
NOTE Confidence: 0.764057965454545

01:00:03.036 --> 01:00:05.047 to the left or to the right,
NOTE Confidence: 0.764057965454545

01:00:05.050 --> 01:00:08.032 but you are there is in MORP,
NOTE Confidence: 0.764057965454545

01:00:08.032 --> 01:00:08.800 as I showed you.
NOTE Confidence: 0.764057965454545

01:00:08.800 --> 01:00:09.816 Doesn't change,
NOTE Confidence: 0.764057965454545

01:00:09.816 --> 01:00:12.356 it's very reproducible from night
NOTE Confidence: 0.764057965454545

01:00:12.356 --> 01:00:15.682 tonight and from one REM episode to

NOTE Confidence: 0.764057965454545

01:00:15.682 --> 01:00:18.268 another RAM episode during the night,

NOTE Confidence: 0.764057965454545

01:00:18.270 --> 01:00:18.700 but.

NOTE Confidence: 0.764057965454545

01:00:18.700 --> 01:00:21.280 I'm actually very glad to see

NOTE Confidence: 0.764057965454545

01:00:21.280 --> 01:00:23.791 Mary Krieger is the one who

NOTE Confidence: 0.764057965454545

01:00:23.791 --> 01:00:25.682 started me who started not know.

NOTE Confidence: 0.764057965454545

01:00:25.682 --> 01:00:28.021 He started me on this but when I

NOTE Confidence: 0.764057965454545

01:00:28.021 --> 01:00:30.025 moved to Winnipeg he showed me how to

NOTE Confidence: 0.764057965454545

01:00:30.025 --> 01:00:32.149 run a sleep lab and stuff like that.

NOTE Confidence: 0.764057965454545

01:00:32.150 --> 01:00:36.530 So thank you mayor and and.

NOTE Confidence: 0.737575571666667

01:00:38.780 --> 01:00:40.646 Any did I answer your question?

NOTE Confidence: 0.963593013333333

01:00:41.840 --> 01:00:44.628 I think so. What we'll do

NOTE Confidence: 0.8581448028

01:00:44.640 --> 01:00:47.270 is we have to wait for the results of the

NOTE Confidence: 0.8581448028

01:00:47.340 --> 01:00:49.596 2020 to come up with the final answer

NOTE Confidence: 0.8581448028

01:00:49.596 --> 01:00:52.420 on how much the ability you get, but you

NOTE Confidence: 0.8581448028

01:00:52.420 --> 01:00:54.160 generally stay within the same pattern.

NOTE Confidence: 0.8581448028

01:00:54.160 --> 01:00:56.016 It's just that you get a little bit
NOTE Confidence: 0.8581448028

01:00:56.016 --> 01:00:58.010 of shift to the left or to the right.
NOTE Confidence: 0.823774098333333

01:00:59.680 --> 01:01:02.092 Suggesting that maybe a a characteristic
NOTE Confidence: 0.823774098333333

01:01:02.092 --> 01:01:04.800 or a trait for an individual.
NOTE Confidence: 0.823774098333333

01:01:04.800 --> 01:01:08.150 Yeah, alright, OK.
NOTE Confidence: 0.823774098333333

01:01:08.150 --> 01:01:10.390 And so I think I'll just ask one
NOTE Confidence: 0.823774098333333

01:01:10.390 --> 01:01:12.228 more question before we finish up.
NOTE Confidence: 0.823774098333333

01:01:12.230 --> 01:01:14.489 Make sure that we are mindful of the time
NOTE Confidence: 0.823774098333333

01:01:14.489 --> 01:01:16.698 and so one of the questions is that,
NOTE Confidence: 0.823774098333333

01:01:16.700 --> 01:01:18.910 like N3 decreases with aging,
NOTE Confidence: 0.823774098333333

01:01:18.910 --> 01:01:21.518 is there data that you looked at that
NOTE Confidence: 0.823774098333333

01:01:21.518 --> 01:01:23.979 shows any changes in RP with aging?
NOTE Confidence: 0.836231478888889

01:01:25.050 --> 01:01:27.346 Yeah, yeah, it's part of the same study
NOTE Confidence: 0.836231478888889

01:01:27.346 --> 01:01:30.196 we are going to be submitting and what
NOTE Confidence: 0.836231478888889

01:01:30.196 --> 01:01:32.382 happens actually with aging I I don't
NOTE Confidence: 0.836231478888889

01:01:32.382 --> 01:01:36.208 know if I have the slides right now,

NOTE Confidence: 0.836231478888889

01:01:36.208 --> 01:01:40.218 but. Uh, no, I don't.

NOTE Confidence: 0.836231478888889

01:01:40.220 --> 01:01:42.908 What happens with aging is the amount in

NOTE Confidence: 0.836231478888889

01:01:42.908 --> 01:01:45.827 deep sleep goes down progressively with age.

NOTE Confidence: 0.836231478888889

01:01:45.830 --> 01:01:49.118 We looked at them from 20 to 90,

NOTE Confidence: 0.836231478888889

01:01:49.120 --> 01:01:51.465 have a group of healthy young people

NOTE Confidence: 0.836231478888889

01:01:51.465 --> 01:01:54.448 from 20 to 4G, and then they sleep

NOTE Confidence: 0.836231478888889

01:01:54.448 --> 01:01:57.320 heart cells which covered 40 to 90.

NOTE Confidence: 0.836231478888889

01:01:57.320 --> 01:01:59.945 And yeah, it's a very very gradual

NOTE Confidence: 0.836231478888889

01:01:59.945 --> 01:02:02.300 drop in amount and deep sleep.

NOTE Confidence: 0.836231478888889

01:02:02.300 --> 01:02:05.926 That's that's the size one and two

NOTE Confidence: 0.836231478888889

01:02:05.926 --> 01:02:08.708 and progressive increase in decile 10.

NOTE Confidence: 0.836231478888889

01:02:08.710 --> 01:02:10.635 OK, so there is a progressive shift.

NOTE Confidence: 0.836231478888889

01:02:10.640 --> 01:02:16.080 To the right in and and the the.

NOTE Confidence: 0.836231478888889

01:02:16.080 --> 01:02:19.272 Epochs with yeah with high the the

NOTE Confidence: 0.836231478888889

01:02:19.272 --> 01:02:22.648 types with high full wakefulness are,

NOTE Confidence: 0.836231478888889

01:02:22.650 --> 01:02:23.336 you know,
NOTE Confidence: 0.836231478888889

01:02:23.336 --> 01:02:26.080 they they are quite frequently in old people,
NOTE Confidence: 0.836231478888889

01:02:26.080 --> 01:02:28.664 but they are very rare in young people.
NOTE Confidence: 0.909964068571429

01:02:29.400 --> 01:02:31.486 Wonderful, well thank you very much man.
NOTE Confidence: 0.909964068571429

01:02:31.490 --> 01:02:33.450 I did this was outstanding and I
NOTE Confidence: 0.909964068571429

01:02:33.450 --> 01:02:35.686 think for the sake of time I'm gonna
NOTE Confidence: 0.909964068571429

01:02:35.690 --> 01:02:37.202 hold off on asking more questions
NOTE Confidence: 0.909964068571429

01:02:37.202 --> 01:02:38.741 and hopefully folks can email you
NOTE Confidence: 0.909964068571429

01:02:38.741 --> 01:02:40.414 and connect with you if they have
NOTE Confidence: 0.909964068571429

01:02:40.414 --> 01:02:41.588 additional questions about you.
NOTE Confidence: 0.836614447

01:02:41.600 --> 01:02:42.677 Absolutely anytime. That's
NOTE Confidence: 0.836614447

01:02:42.677 --> 01:02:45.190 all I do is answer emails so.
NOTE Confidence: 0.78082055

01:02:47.770 --> 01:02:50.894 Alright, thank you very much for hosting me.
NOTE Confidence: 0.87322008625

01:02:51.280 --> 01:02:52.760 You're looking forward to the
NOTE Confidence: 0.87322008625

01:02:52.760 --> 01:02:54.886 next session that we will have in
NOTE Confidence: 0.87322008625

01:02:54.886 --> 01:02:56.700 November on November 10th and so

NOTE Confidence: 0.87322008625

01:02:56.700 --> 01:02:58.590 thank you kindly everyone and stay.

NOTE Confidence: 0.87322008625

01:02:58.590 --> 01:03:01.236 Stay well and enjoy this fall weather.

NOTE Confidence: 0.867011135

01:03:02.580 --> 01:03:03.840 Thank you bye bye.