

WEBVTT

NOTE duration: "01:03:05.472"

NOTE Confidence: 0.89179033

00:00:00.000 --> 00:00:00.500 It's

NOTE Confidence: 0.8920139

00:00:01.760 --> 00:00:02.159 my,

NOTE Confidence: 0.847599

00:00:03.120 --> 00:00:05.359 my pleasure to ins to

NOTE Confidence: 0.847599

00:00:05.359 --> 00:00:07.299 to introduce Krista Lister,

NOTE Confidence: 0.9987285

00:00:08.160 --> 00:00:10.080 who is a professor of

NOTE Confidence: 0.9987285

00:00:10.080 --> 00:00:10.580 psychology

NOTE Confidence: 0.99963486

00:00:11.119 --> 00:00:11.619 at

NOTE Confidence: 0.8793198

00:00:12.175 --> 00:00:14.035 the University of Wisconsin Milwaukee,

NOTE Confidence: 0.9564096

00:00:15.295 --> 00:00:17.135 where she directs the brain

NOTE Confidence: 0.9564096

00:00:17.135 --> 00:00:18.195 imaging and neuropsychology

NOTE Confidence: 0.9972956

00:00:18.895 --> 00:00:19.395 lab.

NOTE Confidence: 0.9907111

00:00:21.135 --> 00:00:22.994 Her research focuses on,

NOTE Confidence: 0.99929726

00:00:23.935 --> 00:00:24.595 the neurocognitive

NOTE Confidence: 0.9863578

00:00:26.119 --> 00:00:28.359 effects of chronic drug use

NOTE Confidence: 0.9863578

00:00:28.359 --> 00:00:29.340 during adolescence
NOTE Confidence: 0.96830523

00:00:30.279 --> 00:00:30.759 and,
NOTE Confidence: 0.91370964

00:00:31.320 --> 00:00:32.059 and adulthood,
NOTE Confidence: 0.9973068

00:00:33.239 --> 00:00:34.540 examining how substances
NOTE Confidence: 0.9475999

00:00:35.079 --> 00:00:35.739 such as
NOTE Confidence: 0.99585164

00:00:36.280 --> 00:00:39.260 cannabis, alcohol, nicotine, and ecstasy
NOTE Confidence: 0.98763394

00:00:39.640 --> 00:00:40.140 impact
NOTE Confidence: 0.96897876

00:00:41.125 --> 00:00:42.664 brain structure and function.
NOTE Confidence: 0.9922265

00:00:43.684 --> 00:00:45.844 She also studies predictors of
NOTE Confidence: 0.9922265

00:00:45.844 --> 00:00:47.945 substance use onset in youth
NOTE Confidence: 0.936125

00:00:48.405 --> 00:00:49.385 and how individual
NOTE Confidence: 0.99508137

00:00:49.925 --> 00:00:51.144 differences that include
NOTE Confidence: 0.9974481

00:00:51.844 --> 00:00:52.344 genetics,
NOTE Confidence: 0.9981653

00:00:52.725 --> 00:00:55.125 gender, physical activity, and body
NOTE Confidence: 0.9981653

00:00:55.125 --> 00:00:55.625 composition
NOTE Confidence: 0.95621955

00:00:56.670 --> 00:00:57.809 moderate vulnerability

NOTE Confidence: 0.9947641

00:00:58.430 --> 00:00:59.489 to these effects.

NOTE Confidence: 0.9744746

00:01:00.910 --> 00:01:02.610 She is a principal investigator

NOTE Confidence: 0.9737493

00:01:02.989 --> 00:01:05.009 or consultant on several large,

NOTE Confidence: 0.9887187

00:01:06.509 --> 00:01:07.009 neuroimaging

NOTE Confidence: 0.5823003

00:01:07.310 --> 00:01:07.709 project,

NOTE Confidence: 0.9660616

00:01:08.110 --> 00:01:10.190 projects, including the ABCD study,

NOTE Confidence: 0.9660616

00:01:10.190 --> 00:01:11.810 which we've heard about,

NOTE Confidence: 0.92177486

00:01:12.485 --> 00:01:13.865 the IDEA consortium,

NOTE Confidence: 0.9766075

00:01:14.165 --> 00:01:15.705 and the MTA neuroimaging

NOTE Confidence: 0.99837327

00:01:16.084 --> 00:01:16.584 study.

NOTE Confidence: 0.90449226

00:01:18.325 --> 00:01:20.265 She also chairs the women

NOTE Confidence: 0.90449226

00:01:20.325 --> 00:01:21.065 in neuropsychology

NOTE Confidence: 0.9805717

00:01:22.325 --> 00:01:24.345 subcommittee of the American

NOTE Confidence: 0.90525144

00:01:24.885 --> 00:01:26.645 of the APA Society for

NOTE Confidence: 0.90525144

00:01:26.645 --> 00:01:27.145 Clinical

NOTE Confidence: 0.99711233

00:01:27.860 --> 00:01:28.360 Neuropsychology.
NOTE Confidence: 0.9963177

00:01:28.900 --> 00:01:29.400 So,
NOTE Confidence: 0.9118005

00:01:30.020 --> 00:01:31.720 Krista, the floor is yours.
NOTE Confidence: 0.9187961

00:01:34.100 --> 00:01:35.700 We we, we are looking
NOTE Confidence: 0.9187961

00:01:35.700 --> 00:01:36.500 forward to,
NOTE Confidence: 0.8116912

00:01:37.860 --> 00:01:38.180 to,
NOTE Confidence: 0.99664426

00:01:39.220 --> 00:01:40.100 what you have to say
NOTE Confidence: 0.99664426

00:01:40.100 --> 00:01:41.480 about this. I was fortunate
NOTE Confidence: 0.99664426

00:01:41.540 --> 00:01:42.040 to
NOTE Confidence: 0.9639245

00:01:42.455 --> 00:01:44.055 to attend your presentation at
NOTE Confidence: 0.9639245

00:01:44.055 --> 00:01:45.595 the Gordon conference, and,
NOTE Confidence: 0.99606955

00:01:46.295 --> 00:01:47.895 I'm sure everyone's gonna really
NOTE Confidence: 0.99606955

00:01:47.895 --> 00:01:49.195 enjoy your presentation.
NOTE Confidence: 0.9920564

00:01:50.055 --> 00:01:51.335 So I'm gonna go ahead
NOTE Confidence: 0.9920564

00:01:51.335 --> 00:01:52.955 and share my slides.
NOTE Confidence: 0.99608666

00:01:58.340 --> 00:01:59.620 So I kinda lose you

NOTE Confidence: 0.99608666

00:01:59.620 --> 00:02:00.660 guys when I have this

NOTE Confidence: 0.99608666

00:02:00.660 --> 00:02:01.620 up. Can you guys see

NOTE Confidence: 0.99608666

00:02:01.620 --> 00:02:02.680 the slides okay?

NOTE Confidence: 0.9507618

00:02:04.980 --> 00:02:06.980 Not yet. Not yet. K.

NOTE Confidence: 0.9507618

00:02:06.980 --> 00:02:07.720 Let me,

NOTE Confidence: 0.9994649

00:02:08.745 --> 00:02:09.644 let me

NOTE Confidence: 0.9997461

00:02:09.944 --> 00:02:10.685 do this.

NOTE Confidence: 0.9988723

00:02:18.584 --> 00:02:19.485 There we go.

NOTE Confidence: 0.89722127

00:02:20.850 --> 00:02:21.650 Now do you guys see

NOTE Confidence: 0.89722127

00:02:21.650 --> 00:02:23.350 it? Yes. If you can.

NOTE Confidence: 0.89722127

00:02:23.410 --> 00:02:24.310 There you go.

NOTE Confidence: 0.99944675

00:02:25.650 --> 00:02:26.150 Alright.

NOTE Confidence: 0.99874187

00:02:26.610 --> 00:02:27.350 Can everybody,

NOTE Confidence: 0.9885901

00:02:27.810 --> 00:02:28.850 also see it? Could you

NOTE Confidence: 0.9885901

00:02:28.850 --> 00:02:29.730 just give a thumbs up

NOTE Confidence: 0.9885901

00:02:29.730 --> 00:02:30.550 in the chat?
NOTE Confidence: 0.99973553

00:02:32.370 --> 00:02:33.669 Yes. I can see it.
NOTE Confidence: 0.9998967

00:02:34.965 --> 00:02:36.565 Okay. Fantastic. Thank you so
NOTE Confidence: 0.9998967

00:02:36.565 --> 00:02:37.065 much.
NOTE Confidence: 0.9922861

00:02:37.605 --> 00:02:38.105 So,
NOTE Confidence: 0.97193193

00:02:38.725 --> 00:02:40.165 I'm gonna go ahead and
NOTE Confidence: 0.97193193

00:02:40.165 --> 00:02:41.945 talk about really an overview
NOTE Confidence: 0.97193193

00:02:42.085 --> 00:02:42.745 of findings
NOTE Confidence: 0.9682493

00:02:43.045 --> 00:02:43.445 focused
NOTE Confidence: 0.9545365

00:02:44.005 --> 00:02:44.885 I guess I'll call it
NOTE Confidence: 0.9545365

00:02:44.885 --> 00:02:46.565 my kind of pandemic update,
NOTE Confidence: 0.9545365

00:02:46.565 --> 00:02:47.910 so mostly on the work
NOTE Confidence: 0.9545365

00:02:47.990 --> 00:02:49.669 kind of post pandemic last
NOTE Confidence: 0.9545365

00:02:49.669 --> 00:02:50.810 four or five years.
NOTE Confidence: 0.99535614

00:02:51.350 --> 00:02:52.790 And so this a lot
NOTE Confidence: 0.99535614

00:02:52.790 --> 00:02:53.990 of this work has continued

NOTE Confidence: 0.99535614
00:02:53.990 --> 00:02:55.050 to look at the impact
NOTE Confidence: 0.99535614
00:02:55.190 --> 00:02:56.870 of kind of cannabis use
NOTE Confidence: 0.99535614
00:02:56.870 --> 00:02:57.370 patterns
NOTE Confidence: 0.91733634
00:02:57.910 --> 00:02:59.610 and then also getting into
NOTE Confidence: 0.91733634
00:02:59.669 --> 00:03:01.050 some relationships or
NOTE Confidence: 0.29149467
00:03:04.165 --> 00:03:04.665 and
NOTE Confidence: 0.9392183
00:03:09.205 --> 00:03:09.705 So,
NOTE Confidence: 0.94479555
00:03:10.245 --> 00:03:10.745 Krista,
NOTE Confidence: 0.9544036
00:03:11.125 --> 00:03:12.425 you're breaking up?
NOTE Confidence: 0.9987312
00:03:13.364 --> 00:03:13.864 No.
NOTE Confidence: 0.97802496
00:03:15.205 --> 00:03:15.705 Yeah.
NOTE Confidence: 0.8776059
00:03:25.350 --> 00:03:26.410 Let me just check.
NOTE Confidence: 0.97727734
00:03:28.725 --> 00:03:29.465 Can you
NOTE Confidence: 0.80316174
00:03:29.845 --> 00:03:30.345 now?
NOTE Confidence: 0.99846524
00:03:30.805 --> 00:03:31.925 Like, is it am I
NOTE Confidence: 0.99846524

00:03:31.925 --> 00:03:32.425 still
NOTE Confidence: 0.9765848

00:03:32.965 --> 00:03:34.965 Yeah. Breaking up? Krista, if
NOTE Confidence: 0.9765848

00:03:34.965 --> 00:03:36.005 you like, you could turn
NOTE Confidence: 0.9765848

00:03:36.005 --> 00:03:37.205 off your camera and just
NOTE Confidence: 0.9765848

00:03:37.205 --> 00:03:38.245 share your screen, and that
NOTE Confidence: 0.9765848

00:03:38.245 --> 00:03:39.385 will help with the bandwidth.
NOTE Confidence: 0.9831586

00:03:41.960 --> 00:03:43.720 You got it. Let's try
NOTE Confidence: 0.9831586

00:03:43.720 --> 00:03:44.220 that.
NOTE Confidence: 0.9297238

00:03:50.680 --> 00:03:51.960 How about that? Can you
NOTE Confidence: 0.9297238

00:03:51.960 --> 00:03:53.160 guys hear me good now?
NOTE Confidence: 0.9297238

00:03:53.160 --> 00:03:54.280 It looks a lot better.
NOTE Confidence: 0.9297238

00:03:54.280 --> 00:03:56.135 Yeah. Okay. Alright. Well, you
NOTE Confidence: 0.9297238

00:03:56.135 --> 00:03:56.935 don't need to see my
NOTE Confidence: 0.9297238

00:03:56.935 --> 00:03:58.075 face anyway. So,
NOTE Confidence: 0.9933419

00:03:59.015 --> 00:04:00.395 okay. So this is just
NOTE Confidence: 0.9815105

00:04:00.775 --> 00:04:02.855 acknowledging some of the, NIH

NOTE Confidence: 0.9815105
00:04:02.855 --> 00:04:03.975 funding. I don't have any
NOTE Confidence: 0.9815105
00:04:03.975 --> 00:04:05.735 other financial conflicts, so I'll
NOTE Confidence: 0.9815105
00:04:05.735 --> 00:04:06.555 jump in.
NOTE Confidence: 0.9753928
00:04:07.255 --> 00:04:08.375 Today, I just like to
NOTE Confidence: 0.9753928
00:04:08.375 --> 00:04:09.655 orient people to what I'm
NOTE Confidence: 0.9753928
00:04:09.655 --> 00:04:10.775 talking about when I say
NOTE Confidence: 0.9753928
00:04:10.775 --> 00:04:11.755 cannabis because,
NOTE Confidence: 0.9982061
00:04:12.400 --> 00:04:13.439 I'm preaching to the choir
NOTE Confidence: 0.9982061
00:04:13.439 --> 00:04:14.319 here, but we know that
NOTE Confidence: 0.9982061
00:04:14.319 --> 00:04:15.620 this is a very complicated
NOTE Confidence: 0.9982061
00:04:15.840 --> 00:04:16.339 plant
NOTE Confidence: 0.993384
00:04:16.880 --> 00:04:19.060 with, over a hundred cannabinoids.
NOTE Confidence: 0.9674397
00:04:19.760 --> 00:04:21.760 I'm primarily talking about really
NOTE Confidence: 0.9674397
00:04:21.760 --> 00:04:22.500 the recreational
NOTE Confidence: 0.9698638
00:04:22.880 --> 00:04:24.660 use of delta nine THC
NOTE Confidence: 0.9698638

00:04:24.880 --> 00:04:26.240 with the intent of getting
NOTE Confidence: 0.9698638

00:04:26.240 --> 00:04:27.845 high. And in particular,
NOTE Confidence: 0.9958855

00:04:28.224 --> 00:04:29.745 talking about users who are
NOTE Confidence: 0.9958855

00:04:29.745 --> 00:04:30.964 using pretty regularly,
NOTE Confidence: 0.9572886

00:04:31.505 --> 00:04:32.705 which I would define as
NOTE Confidence: 0.9572886

00:04:32.705 --> 00:04:33.745 at least once a week,
NOTE Confidence: 0.9572886

00:04:33.745 --> 00:04:35.285 but on average, more like
NOTE Confidence: 0.9572886

00:04:35.425 --> 00:04:36.645 almost every day.
NOTE Confidence: 0.99219525

00:04:37.824 --> 00:04:39.104 I do have some very
NOTE Confidence: 0.99219525

00:04:39.104 --> 00:04:41.044 preliminary data on cannabidiol,
NOTE Confidence: 0.9995657

00:04:41.920 --> 00:04:42.660 and cannabidiol
NOTE Confidence: 0.9789335

00:04:43.200 --> 00:04:45.700 exposure is getting increasingly interesting
NOTE Confidence: 0.9789335

00:04:45.839 --> 00:04:46.880 with, of course, the two
NOTE Confidence: 0.9789335

00:04:46.880 --> 00:04:48.500 thousand eighteen farm bill.
NOTE Confidence: 0.9666516

00:04:49.360 --> 00:04:51.680 Generally, in recreational cannabis to
NOTE Confidence: 0.9666516

00:04:51.680 --> 00:04:52.820 get highs, cannabidiol

NOTE Confidence: 0.97929657
00:04:54.235 --> 00:04:55.595 levels have really gone down
NOTE Confidence: 0.97929657
00:04:55.595 --> 00:04:57.055 over the years, but now
NOTE Confidence: 0.97929657
00:04:57.275 --> 00:04:59.195 CBD is very available, you
NOTE Confidence: 0.97929657
00:04:59.195 --> 00:05:00.555 know, at just,
NOTE Confidence: 0.9977029
00:05:01.195 --> 00:05:03.275 at at stores, grocery stores,
NOTE Confidence: 0.9977029
00:05:03.275 --> 00:05:04.895 you know, salons, etcetera.
NOTE Confidence: 0.9848893
00:05:05.355 --> 00:05:06.875 And we're certainly seeing young
NOTE Confidence: 0.9848893
00:05:06.875 --> 00:05:08.415 people taking CBD,
NOTE Confidence: 0.9997177
00:05:08.849 --> 00:05:09.589 not necessarily
NOTE Confidence: 0.98254263
00:05:10.129 --> 00:05:11.650 recreationally as we think about
NOTE Confidence: 0.98254263
00:05:11.650 --> 00:05:13.009 it, but at at fairly
NOTE Confidence: 0.98254263
00:05:13.009 --> 00:05:14.529 high rates. And so I'm
NOTE Confidence: 0.98254263
00:05:14.529 --> 00:05:15.889 gonna talk about CBD a
NOTE Confidence: 0.98254263
00:05:15.889 --> 00:05:16.930 little bit later in the
NOTE Confidence: 0.98254263
00:05:16.930 --> 00:05:17.430 talk.
NOTE Confidence: 0.99321693

00:05:18.849 --> 00:05:20.469 Of course, cannabis for recreational
NOTE Confidence: 0.99321693

00:05:20.689 --> 00:05:22.210 purposes does start in the
NOTE Confidence: 0.99321693

00:05:22.210 --> 00:05:23.995 teenage years. This is just
NOTE Confidence: 0.99321693

00:05:23.995 --> 00:05:26.495 highlighting that, cannabis or marijuana
NOTE Confidence: 0.99321693

00:05:26.714 --> 00:05:27.835 continues to be a very
NOTE Confidence: 0.99321693

00:05:27.835 --> 00:05:28.815 popular drug.
NOTE Confidence: 0.9831421

00:05:29.195 --> 00:05:31.275 Nearly about forty percent have
NOTE Confidence: 0.9831421

00:05:31.275 --> 00:05:33.355 used by twelfth grade. It's
NOTE Confidence: 0.9831421

00:05:33.355 --> 00:05:35.195 the second most popular after
NOTE Confidence: 0.9831421

00:05:35.195 --> 00:05:35.695 alcohol.
NOTE Confidence: 0.9986857

00:05:36.690 --> 00:05:38.130 And this is occurring during
NOTE Confidence: 0.9986857

00:05:38.130 --> 00:05:41.029 that, very critical adolescent neurodevelopmental
NOTE Confidence: 0.98908216

00:05:41.650 --> 00:05:43.169 stage, which we think of
NOTE Confidence: 0.98908216

00:05:43.169 --> 00:05:44.930 as this real gateway into
NOTE Confidence: 0.98908216

00:05:44.930 --> 00:05:45.430 adulthood
NOTE Confidence: 0.9614089

00:05:46.050 --> 00:05:47.089 where a lot of health

NOTE Confidence: 0.9614089
00:05:47.089 --> 00:05:49.250 behaviors are established during these
NOTE Confidence: 0.9614089
00:05:49.250 --> 00:05:50.849 teenage years, and the brain
NOTE Confidence: 0.9614089
00:05:50.849 --> 00:05:52.755 gets continuing to be quite
NOTE Confidence: 0.9614089
00:05:52.755 --> 00:05:53.255 plastic
NOTE Confidence: 0.93632716
00:05:53.795 --> 00:05:55.335 and having, you know, ongoing
NOTE Confidence: 0.93632716
00:05:55.475 --> 00:05:55.975 neural,
NOTE Confidence: 0.9778795
00:05:56.755 --> 00:05:58.775 neuronal pruning in the prefrontal
NOTE Confidence: 0.9778795
00:05:58.835 --> 00:06:00.835 cortex and parietal cortex and
NOTE Confidence: 0.9778795
00:06:00.835 --> 00:06:01.335 ongoing,
NOTE Confidence: 0.99752426
00:06:02.035 --> 00:06:03.475 increases in white matter and
NOTE Confidence: 0.99752426
00:06:03.475 --> 00:06:05.335 improvements in white matter quality
NOTE Confidence: 0.9908419
00:06:05.659 --> 00:06:06.620 all the way into the
NOTE Confidence: 0.9908419
00:06:06.620 --> 00:06:07.520 early forties.
NOTE Confidence: 0.94212645
00:06:09.659 --> 00:06:10.479 The endocannabinoid
NOTE Confidence: 0.9807464
00:06:10.779 --> 00:06:12.379 system plays a really important
NOTE Confidence: 0.9807464

00:06:12.379 --> 00:06:13.599 role in that neurodevelopment,
NOTE Confidence: 0.96747273

00:06:14.300 --> 00:06:15.979 both during the prenatal stage,
NOTE Confidence: 0.96747273

00:06:15.979 --> 00:06:17.360 but also during adolescence.
NOTE Confidence: 0.97465575

00:06:17.955 --> 00:06:19.235 And, of course, delta nine
NOTE Confidence: 0.97465575

00:06:19.235 --> 00:06:20.935 THC is a partial agonist
NOTE Confidence: 0.97465575

00:06:20.995 --> 00:06:22.694 at the CB one receptor.
NOTE Confidence: 0.9908151

00:06:23.634 --> 00:06:25.175 The endocannabinoid system,
NOTE Confidence: 0.9980202

00:06:25.875 --> 00:06:26.835 plays a role in white
NOTE Confidence: 0.9980202

00:06:26.835 --> 00:06:28.134 matter development, neuroplasticity,
NOTE Confidence: 0.88535756

00:06:28.754 --> 00:06:29.895 functional coupling,
NOTE Confidence: 0.92643434

00:06:30.289 --> 00:06:31.729 And there's some evidence that
NOTE Confidence: 0.92643434

00:06:31.729 --> 00:06:33.110 through the, myocogiel
NOTE Confidence: 0.92767936

00:06:33.410 --> 00:06:35.110 or astrocytes that might be,
NOTE Confidence: 0.92767936

00:06:35.169 --> 00:06:37.169 you know, tagging weaker connections
NOTE Confidence: 0.92767936

00:06:37.169 --> 00:06:38.150 for that pruning.
NOTE Confidence: 0.9638423

00:06:39.089 --> 00:06:39.830 The underlying,

NOTE Confidence: 0.9696133

00:06:40.849 --> 00:06:41.970 constructs that it plays a

NOTE Confidence: 0.9696133

00:06:41.970 --> 00:06:42.930 role in are things like

NOTE Confidence: 0.9696133

00:06:42.930 --> 00:06:45.395 emotion, we reward processing, executive

NOTE Confidence: 0.9696133

00:06:45.395 --> 00:06:47.075 functioning, and memory, which are

NOTE Confidence: 0.9696133

00:06:47.075 --> 00:06:48.915 all very important for, you

NOTE Confidence: 0.9696133

00:06:48.915 --> 00:06:51.315 know, understanding neurodevelopment, but also

NOTE Confidence: 0.9696133

00:06:51.315 --> 00:06:52.995 the development of addiction over

NOTE Confidence: 0.9696133

00:06:52.995 --> 00:06:53.495 time.

NOTE Confidence: 0.9089376

00:06:53.875 --> 00:06:54.915 And it also plays roles

NOTE Confidence: 0.9089376

00:06:54.915 --> 00:06:56.490 in peripheral functions of interest

NOTE Confidence: 0.9089376

00:06:56.569 --> 00:06:58.110 interest like immune inflammation,

NOTE Confidence: 0.99768686

00:06:58.569 --> 00:07:00.669 analgesia, and metabolic processing.

NOTE Confidence: 0.99970007

00:07:01.849 --> 00:07:02.349 Importantly,

NOTE Confidence: 0.91141194

00:07:02.729 --> 00:07:04.669 the CB one receptor density,

NOTE Confidence: 0.98936754

00:07:05.610 --> 00:07:06.669 peaks during adolescence

NOTE Confidence: 0.92137223

00:07:07.130 --> 00:07:08.904 as does two a, two
NOTE Confidence: 0.92137223

00:07:08.904 --> 00:07:10.585 a g and anandamide levels
NOTE Confidence: 0.92137223

00:07:10.585 --> 00:07:12.285 and and anandamide mobilization.
NOTE Confidence: 0.9981254

00:07:15.545 --> 00:07:16.985 So the theory is that
NOTE Confidence: 0.9981254

00:07:16.985 --> 00:07:17.485 repeated,
NOTE Confidence: 0.99278784

00:07:18.265 --> 00:07:21.245 exogenous use of cannabis, especially
NOTE Confidence: 0.99278784

00:07:21.305 --> 00:07:22.765 high THC product,
NOTE Confidence: 0.9833229

00:07:23.360 --> 00:07:25.860 might disrupt that, underlying endocannabinoid
NOTE Confidence: 0.9166956

00:07:26.240 --> 00:07:27.920 system and therefore result in
NOTE Confidence: 0.9166956

00:07:27.920 --> 00:07:28.420 neurocognitive
NOTE Confidence: 0.98570323

00:07:28.800 --> 00:07:29.300 abnormalities.
NOTE Confidence: 0.9890275

00:07:31.600 --> 00:07:32.980 This is a pretty busy
NOTE Confidence: 0.9890275

00:07:33.040 --> 00:07:33.940 slide, but,
NOTE Confidence: 0.93747944

00:07:34.320 --> 00:07:35.120 and I know a lot
NOTE Confidence: 0.93747944

00:07:35.120 --> 00:07:36.325 of you you folks do
NOTE Confidence: 0.93747944

00:07:36.325 --> 00:07:37.845 this work or are very

NOTE Confidence: 0.93747944

00:07:37.845 --> 00:07:38.965 closely tied to it. So

NOTE Confidence: 0.93747944

00:07:38.965 --> 00:07:39.925 I'm not gonna go into

NOTE Confidence: 0.93747944

00:07:39.925 --> 00:07:40.665 every one,

NOTE Confidence: 0.9989278

00:07:41.125 --> 00:07:42.085 but this is just some

NOTE Confidence: 0.9989278

00:07:42.085 --> 00:07:42.825 of the preclinical

NOTE Confidence: 0.98900473

00:07:43.205 --> 00:07:45.445 evidence that, myself as a

NOTE Confidence: 0.98900473

00:07:45.445 --> 00:07:46.345 human researcher,

NOTE Confidence: 0.957563

00:07:47.605 --> 00:07:49.125 gets interested in because it

NOTE Confidence: 0.957563

00:07:49.125 --> 00:07:50.070 shows that,

NOTE Confidence: 0.96373224

00:07:50.550 --> 00:07:52.710 exposure to THC, especially kind

NOTE Confidence: 0.96373224

00:07:52.710 --> 00:07:53.990 of high doses during the

NOTE Confidence: 0.96373224

00:07:53.990 --> 00:07:54.890 teenage years

NOTE Confidence: 0.96014553

00:07:55.430 --> 00:07:56.950 disrupts a lot of the

NOTE Confidence: 0.96014553

00:07:56.950 --> 00:07:57.450 neuronal,

NOTE Confidence: 0.9815615

00:07:58.550 --> 00:07:59.910 markers that we'd be interested

NOTE Confidence: 0.9815615

00:07:59.910 --> 00:08:01.850 in. So we see downregulation
NOTE Confidence: 0.9989301

00:08:02.230 --> 00:08:02.890 or desensitization
NOTE Confidence: 0.96828187

00:08:03.430 --> 00:08:04.855 of the CB one receptors.
NOTE Confidence: 0.96828187

00:08:05.075 --> 00:08:06.215 You know, there's some,
NOTE Confidence: 0.9977259

00:08:06.995 --> 00:08:08.355 disagreement in the literature, but
NOTE Confidence: 0.9977259

00:08:08.355 --> 00:08:09.155 there's a little bit of
NOTE Confidence: 0.9977259

00:08:09.155 --> 00:08:10.515 evidence that that might be
NOTE Confidence: 0.9977259

00:08:10.515 --> 00:08:11.015 especially
NOTE Confidence: 0.9991135

00:08:11.555 --> 00:08:12.855 relevant in females.
NOTE Confidence: 0.99832976

00:08:13.315 --> 00:08:14.515 We see changes in the
NOTE Confidence: 0.99832976

00:08:14.515 --> 00:08:15.815 structures of dendrites,
NOTE Confidence: 0.9733583

00:08:16.250 --> 00:08:18.110 like reduced length or complexity
NOTE Confidence: 0.9733583

00:08:18.250 --> 00:08:19.630 in areas like the hippocampus
NOTE Confidence: 0.9733583

00:08:19.930 --> 00:08:21.229 and prefrontal cortex,
NOTE Confidence: 0.9310897

00:08:21.850 --> 00:08:24.009 and therefore, downstream changes in
NOTE Confidence: 0.9310897

00:08:24.009 --> 00:08:24.669 the connectivity

NOTE Confidence: 0.9992502

00:08:24.970 --> 00:08:26.590 patterns between those structures.

NOTE Confidence: 0.9976715

00:08:27.370 --> 00:08:28.889 We see altered glutamate and

NOTE Confidence: 0.9976715

00:08:28.889 --> 00:08:29.789 GABA signaling,

NOTE Confidence: 0.98144144

00:08:30.250 --> 00:08:32.144 altered glial cell function and

NOTE Confidence: 0.98144144

00:08:32.144 --> 00:08:33.205 synaptic plasticity,

NOTE Confidence: 0.99461347

00:08:33.584 --> 00:08:34.565 increased inflammation,

NOTE Confidence: 0.95301014

00:08:35.665 --> 00:08:38.464 abnormal abnormalities in microglial function.

NOTE Confidence: 0.95301014

00:08:38.464 --> 00:08:39.505 Now this is also a

NOTE Confidence: 0.95301014

00:08:39.505 --> 00:08:40.964 bit of a mixed literature.

NOTE Confidence: 0.9969503

00:08:41.345 --> 00:08:42.325 Some have found,

NOTE Confidence: 0.9838303

00:08:43.425 --> 00:08:45.665 stimulated microglia. Some have found

NOTE Confidence: 0.9838303

00:08:45.665 --> 00:08:47.800 blunted microglia that might depend

NOTE Confidence: 0.9838303

00:08:47.800 --> 00:08:49.320 on the sex of the

NOTE Confidence: 0.9838303

00:08:49.320 --> 00:08:50.840 animal or the timing of

NOTE Confidence: 0.9838303

00:08:50.840 --> 00:08:52.520 the exposure or the extent

NOTE Confidence: 0.9838303

00:08:52.520 --> 00:08:53.420 of the dose.
NOTE Confidence: 0.9516699

00:08:53.880 --> 00:08:55.160 There have been evidence of
NOTE Confidence: 0.9516699

00:08:55.160 --> 00:08:57.800 epigenetic changes in opioid and
NOTE Confidence: 0.9516699

00:08:57.800 --> 00:08:58.300 neurodevelopmental
NOTE Confidence: 0.9687354

00:08:58.840 --> 00:09:00.540 genes, as well as endocannabinoid
NOTE Confidence: 0.9874332

00:09:01.000 --> 00:09:01.500 genes.
NOTE Confidence: 0.98567355

00:09:03.615 --> 00:09:06.015 THC exposed adolescent animals with
NOTE Confidence: 0.98567355

00:09:06.015 --> 00:09:07.375 a large dose have been
NOTE Confidence: 0.98567355

00:09:07.375 --> 00:09:09.395 shown kind of blunted responsivity
NOTE Confidence: 0.9689964

00:09:09.855 --> 00:09:12.115 to stressors, including social stress.
NOTE Confidence: 0.9530148

00:09:12.735 --> 00:09:14.595 And interestingly, on the metabolic
NOTE Confidence: 0.9530148

00:09:14.815 --> 00:09:15.315 side,
NOTE Confidence: 0.9851144

00:09:16.559 --> 00:09:18.660 heavy THC exposure during adolescence
NOTE Confidence: 0.9851144

00:09:18.960 --> 00:09:20.160 resulted in kind of a
NOTE Confidence: 0.9851144

00:09:20.160 --> 00:09:22.559 pseudo lean state. So although
NOTE Confidence: 0.9851144

00:09:22.559 --> 00:09:24.320 it's lower weight, there's a

NOTE Confidence: 0.9851144
00:09:24.320 --> 00:09:25.700 disruption in the thermogenesis
NOTE Confidence: 0.8941753
00:09:27.200 --> 00:09:28.179 and the lipolysis
NOTE Confidence: 0.89412653
00:09:28.559 --> 00:09:30.000 so that the brain might
NOTE Confidence: 0.89412653
00:09:30.000 --> 00:09:31.200 actually have kind of abnormal
NOTE Confidence: 0.89412653
00:09:31.200 --> 00:09:32.145 energetics during physical activity or
NOTE Confidence: 0.9959359
00:09:32.865 --> 00:09:34.465 energetics during physical activity or
NOTE Confidence: 0.9959359
00:09:34.465 --> 00:09:34.965 stress
NOTE Confidence: 0.9444057
00:09:35.345 --> 00:09:37.265 because these mechanisms rely on
NOTE Confidence: 0.9444057
00:09:37.265 --> 00:09:38.565 fatty acids from,
NOTE Confidence: 0.99902534
00:09:39.025 --> 00:09:40.005 the body fat.
NOTE Confidence: 0.85455465
00:09:41.105 --> 00:09:42.485 Importantly for neurocognitive
NOTE Confidence: 0.9928337
00:09:42.945 --> 00:09:44.965 effects, we see that adolescent
NOTE Confidence: 0.9928337
00:09:45.025 --> 00:09:47.365 exposed animals have functional deficits
NOTE Confidence: 0.9928337
00:09:47.505 --> 00:09:49.100 that last into adulthood
NOTE Confidence: 0.98696214
00:09:49.559 --> 00:09:50.540 that are quantitatively
NOTE Confidence: 0.9989481

00:09:50.920 --> 00:09:51.740 and qualitatively
NOTE Confidence: 0.9976408

00:09:52.200 --> 00:09:54.220 different than when you expose,
NOTE Confidence: 0.8845272

00:09:55.880 --> 00:09:57.420 adult animals to THC.
NOTE Confidence: 0.99884045

00:09:58.520 --> 00:09:59.820 So this just provides,
NOTE Confidence: 0.99163705

00:10:00.475 --> 00:10:01.595 you know, some really nice
NOTE Confidence: 0.99163705

00:10:01.595 --> 00:10:03.275 preclinical evidence that this might
NOTE Confidence: 0.99163705

00:10:03.275 --> 00:10:04.395 be an important thing to
NOTE Confidence: 0.99163705

00:10:04.395 --> 00:10:05.054 look at,
NOTE Confidence: 0.9986381

00:10:05.434 --> 00:10:07.355 especially since such a high
NOTE Confidence: 0.9986381

00:10:07.355 --> 00:10:08.735 number of teenagers
NOTE Confidence: 0.99928635

00:10:09.275 --> 00:10:11.115 are being exposed to THC
NOTE Confidence: 0.99928635

00:10:11.115 --> 00:10:12.655 products during their development.
NOTE Confidence: 0.9932095

00:10:14.900 --> 00:10:16.179 Before I jump into some
NOTE Confidence: 0.9932095

00:10:16.179 --> 00:10:17.220 of the studies, I just
NOTE Confidence: 0.9932095

00:10:17.220 --> 00:10:19.220 wanna anchor people into some
NOTE Confidence: 0.9932095

00:10:19.220 --> 00:10:20.760 of our main methods here.

NOTE Confidence: 0.97967285

00:10:22.340 --> 00:10:23.780 A series of now some

NOTE Confidence: 0.97967285

00:10:23.780 --> 00:10:25.140 of my studies come from

NOTE Confidence: 0.97967285

00:10:25.140 --> 00:10:26.820 the IDEA consortium, which is

NOTE Confidence: 0.97967285

00:10:26.820 --> 00:10:27.480 a larger

NOTE Confidence: 0.9536345

00:10:28.274 --> 00:10:31.014 combination or harmonized dataset across

NOTE Confidence: 0.9536345

00:10:31.154 --> 00:10:32.195 a few different r o

NOTE Confidence: 0.9536345

00:10:32.195 --> 00:10:33.875 ones, and then others are

NOTE Confidence: 0.9536345

00:10:33.875 --> 00:10:34.595 just from,

NOTE Confidence: 0.96358585

00:10:35.075 --> 00:10:36.514 my relative. Now I call

NOTE Confidence: 0.96358585

00:10:36.514 --> 00:10:37.635 it a smaller study. It

NOTE Confidence: 0.96358585

00:10:37.635 --> 00:10:39.235 felt good. It felt big

NOTE Confidence: 0.96358585

00:10:39.235 --> 00:10:40.695 before a, b, c, d.

NOTE Confidence: 0.99234504

00:10:41.690 --> 00:10:42.649 And I'll talk about a,

NOTE Confidence: 0.99234504

00:10:42.649 --> 00:10:43.769 b, c, d methods a

NOTE Confidence: 0.99234504

00:10:43.769 --> 00:10:45.450 little later. But these are

NOTE Confidence: 0.99234504

00:10:45.450 --> 00:10:47.130 generally sixteen to twenty five
NOTE Confidence: 0.99234504

00:10:47.130 --> 00:10:48.410 year olds. They came in
NOTE Confidence: 0.99234504

00:10:48.410 --> 00:10:50.029 weekly for three weeks,
NOTE Confidence: 0.9891384

00:10:50.410 --> 00:10:52.670 to confirm abstinence from THC
NOTE Confidence: 0.9891384

00:10:52.730 --> 00:10:54.029 as well as other drugs.
NOTE Confidence: 0.96992314

00:10:54.345 --> 00:10:55.804 So they wore sweat patches
NOTE Confidence: 0.96992314

00:10:55.945 --> 00:10:57.065 over the week and also
NOTE Confidence: 0.96992314

00:10:57.065 --> 00:10:59.084 gave urine toxicology and breathalyzers.
NOTE Confidence: 0.91890246

00:11:00.105 --> 00:11:02.125 They received a mini repeated
NOTE Confidence: 0.91890246

00:11:02.184 --> 00:11:04.264 measures, neuropsych battery and mood
NOTE Confidence: 0.91890246

00:11:04.264 --> 00:11:05.865 battery as long as, also
NOTE Confidence: 0.91890246

00:11:05.865 --> 00:11:07.804 withdrawal symptoms from cannabis.
NOTE Confidence: 0.9872947

00:11:08.360 --> 00:11:09.240 And then they came in
NOTE Confidence: 0.9872947

00:11:09.240 --> 00:11:10.520 for final sessions with a
NOTE Confidence: 0.9872947

00:11:10.520 --> 00:11:11.420 full neuropsychological
NOTE Confidence: 0.997246

00:11:11.960 --> 00:11:12.460 battery,

NOTE Confidence: 0.9588194
00:11:13.320 --> 00:11:15.420 structural and functional MRI,
NOTE Confidence: 0.96534425
00:11:15.880 --> 00:11:17.080 as well as VO two
NOTE Confidence: 0.96534425
00:11:17.080 --> 00:11:18.120 max testing, which I am
NOTE Confidence: 0.96534425
00:11:18.120 --> 00:11:19.160 gonna touch on, but this
NOTE Confidence: 0.96534425
00:11:19.160 --> 00:11:21.000 is an objective marker of
NOTE Confidence: 0.96534425
00:11:21.000 --> 00:11:22.780 their aerobic fitness.
NOTE Confidence: 0.99957156
00:11:24.255 --> 00:11:25.475 The cannabis users
NOTE Confidence: 0.9643069
00:11:26.095 --> 00:11:27.615 are not treatment seeking, but
NOTE Confidence: 0.9643069
00:11:27.615 --> 00:11:29.215 they are regular to heavy
NOTE Confidence: 0.9643069
00:11:29.215 --> 00:11:30.575 users. So they've used at
NOTE Confidence: 0.9643069
00:11:30.575 --> 00:11:31.695 least fifty times in the
NOTE Confidence: 0.9643069
00:11:31.695 --> 00:11:33.295 past year. But on average,
NOTE Confidence: 0.9643069
00:11:33.295 --> 00:11:35.135 they're daily users, and they
NOTE Confidence: 0.9643069
00:11:35.135 --> 00:11:36.595 have primarily smoked,
NOTE Confidence: 0.9856911
00:11:37.215 --> 00:11:38.835 THC flower products.
NOTE Confidence: 0.99160165

00:11:39.220 --> 00:11:40.100 There's a little bit of
NOTE Confidence: 0.99160165

00:11:40.100 --> 00:11:41.300 edibles and a little bit
NOTE Confidence: 0.99160165

00:11:41.300 --> 00:11:42.580 of oil use in there,
NOTE Confidence: 0.99160165

00:11:42.580 --> 00:11:44.740 but it's, the study ended
NOTE Confidence: 0.99160165

00:11:44.740 --> 00:11:46.179 data collection before the, like,
NOTE Confidence: 0.99160165

00:11:46.179 --> 00:11:46.840 the really
NOTE Confidence: 0.8607647

00:11:47.380 --> 00:11:48.360 strong proliferate
NOTE Confidence: 0.9996851

00:11:48.740 --> 00:11:50.120 proliferation of vaping.
NOTE Confidence: 0.9778433

00:11:50.900 --> 00:11:52.179 It did exclude for very
NOTE Confidence: 0.9778433

00:11:52.179 --> 00:11:53.845 heavy drinking. They hadn't used
NOTE Confidence: 0.9778433

00:11:53.845 --> 00:11:55.125 other drugs more than twenty
NOTE Confidence: 0.9778433

00:11:55.125 --> 00:11:55.625 times.
NOTE Confidence: 0.9931643

00:11:56.085 --> 00:11:57.525 And the controls couldn't use
NOTE Confidence: 0.9931643

00:11:57.525 --> 00:11:58.965 any cannabis or marijuana in
NOTE Confidence: 0.9931643

00:11:58.965 --> 00:11:59.925 the past year, but they
NOTE Confidence: 0.9931643

00:11:59.925 --> 00:12:00.804 might have used a few

NOTE Confidence: 0.9931643

00:12:00.804 --> 00:12:02.405 times in their lifetime, and

NOTE Confidence: 0.9931643

00:12:02.405 --> 00:12:03.945 they also had similar exclusions.

NOTE Confidence: 0.9991596

00:12:05.045 --> 00:12:06.325 It's notable that this is

NOTE Confidence: 0.9991596

00:12:06.325 --> 00:12:07.865 a very healthy sample.

NOTE Confidence: 0.9983557

00:12:08.309 --> 00:12:09.929 They couldn't have any MRI

NOTE Confidence: 0.9983557

00:12:10.070 --> 00:12:10.570 contraindications.

NOTE Confidence: 0.97878075

00:12:11.510 --> 00:12:12.790 There's they couldn't have an

NOTE Confidence: 0.97878075

00:12:12.790 --> 00:12:15.290 independent access one psychiatric disorder.

NOTE Confidence: 0.9896018

00:12:15.750 --> 00:12:17.190 And notably, there were a

NOTE Confidence: 0.9896018

00:12:17.190 --> 00:12:18.309 good number of people that

NOTE Confidence: 0.9896018

00:12:18.309 --> 00:12:20.490 were excluded because they had

NOTE Confidence: 0.9896018

00:12:20.630 --> 00:12:22.150 a history of depression in

NOTE Confidence: 0.9896018

00:12:22.150 --> 00:12:22.650 particular

NOTE Confidence: 0.9967785

00:12:23.615 --> 00:12:24.434 or ADHD.

NOTE Confidence: 0.9658966

00:12:25.135 --> 00:12:26.355 They couldn't be on psychiatric

NOTE Confidence: 0.9658966

00:12:26.495 --> 00:12:26.995 medications.
NOTE Confidence: 0.990885

00:12:27.855 --> 00:12:30.255 No, complicated or premature birth
NOTE Confidence: 0.990885

00:12:30.255 --> 00:12:31.695 or prenatal alcohol and drug
NOTE Confidence: 0.990885

00:12:31.695 --> 00:12:33.214 exposure. We did interview the
NOTE Confidence: 0.990885

00:12:33.214 --> 00:12:35.075 parents to confirm this information
NOTE Confidence: 0.990885

00:12:35.214 --> 00:12:36.255 along with the teens and
NOTE Confidence: 0.990885

00:12:36.255 --> 00:12:36.995 young adults,
NOTE Confidence: 0.9152561

00:12:37.480 --> 00:12:38.679 and they couldn't have any
NOTE Confidence: 0.9152561

00:12:38.679 --> 00:12:40.700 neurologic major medical illnesses
NOTE Confidence: 0.9920062

00:12:41.080 --> 00:12:43.080 or metabolic conditions because we
NOTE Confidence: 0.9920062

00:12:43.080 --> 00:12:44.360 were interested in this kind
NOTE Confidence: 0.9920062

00:12:44.360 --> 00:12:46.140 of aerobic activity question.
NOTE Confidence: 0.9978386

00:12:47.080 --> 00:12:48.360 So they had to maintain
NOTE Confidence: 0.9978386

00:12:48.360 --> 00:12:49.800 abstinence for at least fourteen
NOTE Confidence: 0.9978386

00:12:49.800 --> 00:12:51.580 days, and this was confirmed
NOTE Confidence: 0.9978386

00:12:51.640 --> 00:12:52.380 by toxicology.

NOTE Confidence: 0.96481735

00:12:55.365 --> 00:12:56.725 On average, these,

NOTE Confidence: 0.99557525

00:12:57.285 --> 00:12:59.125 this cohort is about twenty

NOTE Confidence: 0.99557525

00:12:59.125 --> 00:13:01.205 one years old. They have

NOTE Confidence: 0.99557525

00:13:01.205 --> 00:13:02.184 some college.

NOTE Confidence: 0.9653288

00:13:03.045 --> 00:13:04.485 Certainly, there's people that didn't

NOTE Confidence: 0.9653288

00:13:04.485 --> 00:13:05.445 go to college, but that's

NOTE Confidence: 0.9653288

00:13:05.445 --> 00:13:06.505 kind of their average.

NOTE Confidence: 0.7924606

00:13:06.965 --> 00:13:07.365 Their,

NOTE Confidence: 0.99755776

00:13:08.245 --> 00:13:08.745 verbal

NOTE Confidence: 0.98650086

00:13:09.100 --> 00:13:10.460 IQ estimate is in the

NOTE Confidence: 0.98650086

00:13:10.460 --> 00:13:12.080 average to high average range.

NOTE Confidence: 0.9914569

00:13:12.540 --> 00:13:14.080 Their depressive symptoms

NOTE Confidence: 0.9290662

00:13:14.540 --> 00:13:16.380 were within the normal level,

NOTE Confidence: 0.9290662

00:13:16.380 --> 00:13:17.520 although the,

NOTE Confidence: 0.99801034

00:13:17.900 --> 00:13:19.420 cannabis users did have a

NOTE Confidence: 0.99801034

00:13:19.420 --> 00:13:19.920 significantly
NOTE Confidence: 0.960191

00:13:20.300 --> 00:13:20.800 increased,
NOTE Confidence: 0.99273175

00:13:21.740 --> 00:13:22.720 number of symptoms.
NOTE Confidence: 0.96301836

00:13:23.535 --> 00:13:24.735 They were a little bit
NOTE Confidence: 0.96301836

00:13:24.735 --> 00:13:27.235 skewed towards male and Caucasian,
NOTE Confidence: 0.96301836

00:13:27.454 --> 00:13:28.274 non Hispanic.
NOTE Confidence: 0.9978869

00:13:29.934 --> 00:13:31.054 And I already talked about
NOTE Confidence: 0.9978869

00:13:31.054 --> 00:13:32.334 their kind of average drug
NOTE Confidence: 0.9978869

00:13:32.334 --> 00:13:32.834 use.
NOTE Confidence: 0.97480047

00:13:33.934 --> 00:13:35.214 I will note that their
NOTE Confidence: 0.97480047

00:13:35.214 --> 00:13:36.654 past year alcohol use, even
NOTE Confidence: 0.97480047

00:13:36.654 --> 00:13:37.934 though we controlled for very
NOTE Confidence: 0.97480047

00:13:37.934 --> 00:13:39.630 heavy drinkers that which got
NOTE Confidence: 0.97480047

00:13:39.630 --> 00:13:41.309 rid of the, like, really
NOTE Confidence: 0.97480047

00:13:41.309 --> 00:13:42.690 repeated binge drinkers.
NOTE Confidence: 0.97952306

00:13:42.990 --> 00:13:45.230 The cannabis users still had,

NOTE Confidence: 0.99862075
00:13:45.550 --> 00:13:46.050 statistically
NOTE Confidence: 0.96533424
00:13:46.430 --> 00:13:49.170 higher alcohol use and cotinine
NOTE Confidence: 0.96533424
00:13:49.309 --> 00:13:49.809 levels,
NOTE Confidence: 0.9813742
00:13:50.110 --> 00:13:51.809 although nicotine use was relatively
NOTE Confidence: 0.9813742
00:13:51.870 --> 00:13:52.930 low in the sample.
NOTE Confidence: 0.9861984
00:13:56.245 --> 00:13:57.605 Okay. So this is just
NOTE Confidence: 0.9861984
00:13:57.605 --> 00:13:59.705 highlighting a couple of cognition
NOTE Confidence: 0.9861984
00:14:00.005 --> 00:14:01.285 studies. These are a little
NOTE Confidence: 0.9861984
00:14:01.285 --> 00:14:03.205 bit earlier, and I'll I'll
NOTE Confidence: 0.9861984
00:14:03.205 --> 00:14:04.085 touch a little bit on
NOTE Confidence: 0.9861984
00:14:04.085 --> 00:14:05.285 cognition. But just to kind
NOTE Confidence: 0.9861984
00:14:05.285 --> 00:14:06.485 of give a little bit
NOTE Confidence: 0.9861984
00:14:06.485 --> 00:14:07.765 of what we've seen across
NOTE Confidence: 0.9861984
00:14:07.765 --> 00:14:09.330 studies for the the downstream
NOTE Confidence: 0.9861984
00:14:09.390 --> 00:14:11.170 cognitive effects that we see.
NOTE Confidence: 0.9639776

00:14:11.630 --> 00:14:13.790 And typically we see, kind
NOTE Confidence: 0.9639776

00:14:13.790 --> 00:14:16.130 of reduced psychomotor speed,
NOTE Confidence: 0.9793585

00:14:16.589 --> 00:14:19.250 reduced complex or sustained attention,
NOTE Confidence: 0.82839125

00:14:20.830 --> 00:14:21.970 and poor inhibitory
NOTE Confidence: 0.998212

00:14:22.350 --> 00:14:24.210 control. And this is after
NOTE Confidence: 0.9990952

00:14:24.615 --> 00:14:25.815 two to four weeks of
NOTE Confidence: 0.9990952

00:14:25.815 --> 00:14:26.315 abstinence.
NOTE Confidence: 0.99221534

00:14:27.095 --> 00:14:28.215 We do see that in
NOTE Confidence: 0.99221534

00:14:28.215 --> 00:14:30.295 the younger cohorts. So on
NOTE Confidence: 0.99221534

00:14:30.295 --> 00:14:31.415 the left there, I have
NOTE Confidence: 0.99221534

00:14:31.415 --> 00:14:33.015 an older study. My prior
NOTE Confidence: 0.99221534

00:14:33.015 --> 00:14:33.995 name was Medina.
NOTE Confidence: 0.95280313

00:14:35.895 --> 00:14:37.575 These are adolescent, so more
NOTE Confidence: 0.95280313

00:14:37.575 --> 00:14:38.055 like,
NOTE Confidence: 0.99686325

00:14:38.600 --> 00:14:40.540 sixteen to nineteen year olds.
NOTE Confidence: 0.98341733

00:14:41.080 --> 00:14:41.880 We do see that the

NOTE Confidence: 0.98341733

00:14:41.880 --> 00:14:43.720 effect sizes are larger in

NOTE Confidence: 0.98341733

00:14:43.720 --> 00:14:45.960 the younger cohorts versus the

NOTE Confidence: 0.98341733

00:14:45.960 --> 00:14:48.140 later adolescent, young adult cohorts,

NOTE Confidence: 0.9996137

00:14:48.520 --> 00:14:49.800 but the type of cognitive

NOTE Confidence: 0.9996137

00:14:49.800 --> 00:14:51.480 functioning that's impaired is pretty

NOTE Confidence: 0.9996137

00:14:51.480 --> 00:14:51.980 similar.

NOTE Confidence: 0.94784886

00:14:52.995 --> 00:14:54.115 And I just wanna highlight

NOTE Confidence: 0.94784886

00:14:54.115 --> 00:14:55.875 that there's been now several

NOTE Confidence: 0.94784886

00:14:55.875 --> 00:14:57.875 meta analyses kind of looking

NOTE Confidence: 0.94784886

00:14:57.875 --> 00:14:59.955 at, you know, multiple studies

NOTE Confidence: 0.94784886

00:14:59.955 --> 00:15:01.095 and multiple cohorts.

NOTE Confidence: 0.9519445

00:15:01.555 --> 00:15:03.315 And the most consistent finding

NOTE Confidence: 0.9519445

00:15:03.315 --> 00:15:04.915 is in the verbal

NOTE Confidence: 0.9519445

00:15:04.915 --> 00:15:07.095 memory, although, notably, that's

NOTE Confidence: 0.99229115

00:15:07.410 --> 00:15:08.690 when there is only a

NOTE Confidence: 0.99229115

00:15:08.690 --> 00:15:10.630 few days of abstinence required.

NOTE Confidence: 0.9920845

00:15:11.410 --> 00:15:13.670 And, the the more sustained

NOTE Confidence: 0.9920845

00:15:13.730 --> 00:15:15.589 deficits are in complex attention,

NOTE Confidence: 0.9920845

00:15:15.730 --> 00:15:17.570 processing speed, and aspects of

NOTE Confidence: 0.9920845

00:15:17.570 --> 00:15:20.310 executive functioning, especially inhibitory control,

NOTE Confidence: 0.9985467

00:15:20.775 --> 00:15:21.975 and the effect sizes are

NOTE Confidence: 0.9985467

00:15:21.975 --> 00:15:23.115 relatively small.

NOTE Confidence: 0.9986842

00:15:25.495 --> 00:15:27.595 So speaking of inhibitory control,

NOTE Confidence: 0.98027706

00:15:28.615 --> 00:15:30.795 this cohort received an emotional

NOTE Confidence: 0.98027706

00:15:30.935 --> 00:15:33.335 no go task. And, this

NOTE Confidence: 0.98027706

00:15:33.335 --> 00:15:35.675 analysis specifically looked at

NOTE Confidence: 0.9733831

00:15:36.060 --> 00:15:37.660 processing during the,

NOTE Confidence: 0.9418236

00:15:38.700 --> 00:15:40.460 no go or inhibitory trials

NOTE Confidence: 0.9418236

00:15:40.460 --> 00:15:42.220 while they were processing calm

NOTE Confidence: 0.9418236

00:15:42.220 --> 00:15:42.720 faces.

NOTE Confidence: 0.99179506

00:15:43.340 --> 00:15:44.700 So although it's within the
NOTE Confidence: 0.99179506

00:15:44.700 --> 00:15:46.860 context of this affective state,
NOTE Confidence: 0.99179506

00:15:46.860 --> 00:15:48.780 the, calm faces are considered
NOTE Confidence: 0.99179506

00:15:48.780 --> 00:15:49.280 neutral.
NOTE Confidence: 0.9993977

00:15:50.075 --> 00:15:51.035 And what we found is
NOTE Confidence: 0.9993977

00:15:51.035 --> 00:15:51.855 that despite
NOTE Confidence: 0.9875014

00:15:52.155 --> 00:15:53.995 similar performance, you know, on
NOTE Confidence: 0.9875014

00:15:53.995 --> 00:15:55.435 the behavioral task in the
NOTE Confidence: 0.9875014

00:15:55.435 --> 00:15:55.935 scanner,
NOTE Confidence: 0.94891614

00:15:56.635 --> 00:15:58.495 the cannabis users had increased
NOTE Confidence: 0.94891614

00:15:58.555 --> 00:16:00.655 fold activation versus the controls
NOTE Confidence: 0.9032402

00:16:01.115 --> 00:16:03.455 and left medial superior frontal
NOTE Confidence: 0.9032402

00:16:03.515 --> 00:16:05.215 and left cingulate cortex.
NOTE Confidence: 0.99877214

00:16:06.000 --> 00:16:07.460 So this pattern was interpreted
NOTE Confidence: 0.99877214

00:16:07.680 --> 00:16:09.360 as kind of using greater
NOTE Confidence: 0.99877214

00:16:09.360 --> 00:16:11.440 prefrontal resources to complete the

NOTE Confidence: 0.99877214
00:16:11.440 --> 00:16:12.260 same task
NOTE Confidence: 0.9873613
00:16:12.800 --> 00:16:13.920 even after two to three
NOTE Confidence: 0.9873613
00:16:13.920 --> 00:16:14.900 weeks of abstinence.
NOTE Confidence: 0.99887383
00:16:15.520 --> 00:16:17.360 And because behavior was the
NOTE Confidence: 0.99887383
00:16:17.360 --> 00:16:18.580 same at this point,
NOTE Confidence: 0.9142065
00:16:19.175 --> 00:16:20.214 it's thought that that for
NOTE Confidence: 0.9142065
00:16:20.214 --> 00:16:21.415 the most part, this was
NOTE Confidence: 0.9142065
00:16:21.415 --> 00:16:22.555 successful compensation.
NOTE Confidence: 0.96854526
00:16:26.295 --> 00:16:28.134 We are also interested in
NOTE Confidence: 0.96854526
00:16:28.134 --> 00:16:29.814 this study to start getting
NOTE Confidence: 0.96854526
00:16:29.814 --> 00:16:31.690 at more of the affective
NOTE Confidence: 0.96854526
00:16:31.750 --> 00:16:34.010 side or the interplay between
NOTE Confidence: 0.96854526
00:16:34.070 --> 00:16:35.769 affect inhibitory control
NOTE Confidence: 0.83821726
00:16:36.550 --> 00:16:37.050 because,
NOTE Confidence: 0.94859374
00:16:37.589 --> 00:16:39.350 mostly because for one thing
NOTE Confidence: 0.94859374

00:16:39.350 --> 00:16:40.890 that maps onto the endocannabinoid

NOTE Confidence: 0.94859374

00:16:41.190 --> 00:16:42.950 system. But also in the

NOTE Confidence: 0.94859374

00:16:42.950 --> 00:16:44.730 clinic, we tend to see

NOTE Confidence: 0.9753565

00:16:45.055 --> 00:16:47.135 that, it's that interplay between

NOTE Confidence: 0.9753565

00:16:47.135 --> 00:16:48.815 kind of cold cognition and

NOTE Confidence: 0.9753565

00:16:48.815 --> 00:16:50.575 affective states that really gets

NOTE Confidence: 0.9753565

00:16:50.575 --> 00:16:52.415 people into kinda trouble or

NOTE Confidence: 0.9753565

00:16:52.415 --> 00:16:52.915 or,

NOTE Confidence: 0.99931896

00:16:53.455 --> 00:16:54.655 has them facing a lot

NOTE Confidence: 0.99931896

00:16:54.655 --> 00:16:55.315 of challenges.

NOTE Confidence: 0.98554355

00:16:56.415 --> 00:16:57.875 So what we saw here,

NOTE Confidence: 0.98554355

00:16:58.089 --> 00:16:58.890 first off,

NOTE Confidence: 0.99511635

00:16:59.210 --> 00:17:00.810 in several studies, we we've

NOTE Confidence: 0.99511635

00:17:00.810 --> 00:17:01.790 seen abnormal,

NOTE Confidence: 0.94704854

00:17:02.410 --> 00:17:04.809 rostral anterior cingulate volume in

NOTE Confidence: 0.94704854

00:17:04.809 --> 00:17:05.869 cannabis users.

NOTE Confidence: 0.93178886
00:17:06.170 --> 00:17:07.290 And once again, in the
NOTE Confidence: 0.93178886
00:17:07.290 --> 00:17:08.570 sample, we see the same
NOTE Confidence: 0.93178886
00:17:08.570 --> 00:17:09.070 thing.
NOTE Confidence: 0.96236956
00:17:09.450 --> 00:17:11.369 And the smaller volume was
NOTE Confidence: 0.96236956
00:17:11.369 --> 00:17:13.505 related to worse emotional discrimination
NOTE Confidence: 0.99814236
00:17:14.125 --> 00:17:15.425 on a on a behavioral
NOTE Confidence: 0.99814236
00:17:15.485 --> 00:17:17.025 task outside of the scanner.
NOTE Confidence: 0.9992546
00:17:18.285 --> 00:17:19.725 We also saw that as
NOTE Confidence: 0.9992546
00:17:19.725 --> 00:17:20.625 they were processing,
NOTE Confidence: 0.96940815
00:17:21.325 --> 00:17:23.885 the the fearful faces presented
NOTE Confidence: 0.96940815
00:17:23.885 --> 00:17:25.185 during the go trials,
NOTE Confidence: 0.9920526
00:17:26.330 --> 00:17:27.609 that we they actually had
NOTE Confidence: 0.9920526
00:17:27.609 --> 00:17:29.530 blunted bold response in the
NOTE Confidence: 0.9920526
00:17:29.530 --> 00:17:30.350 same region
NOTE Confidence: 0.9264414
00:17:30.810 --> 00:17:32.490 despite having kind of similar
NOTE Confidence: 0.9264414

00:17:32.490 --> 00:17:33.710 connectivity patterns.
NOTE Confidence: 0.9996939

00:17:34.970 --> 00:17:35.470 So
NOTE Confidence: 0.9739224

00:17:36.090 --> 00:17:37.130 what we see here is
NOTE Confidence: 0.9739224

00:17:37.130 --> 00:17:38.410 that after those three weeks
NOTE Confidence: 0.9739224

00:17:38.410 --> 00:17:40.030 of abstinence, the rostrum
NOTE Confidence: 0.8620933

00:17:40.490 --> 00:17:41.470 anterior cingulate
NOTE Confidence: 0.99778587

00:17:41.975 --> 00:17:43.494 is kind of blunted in
NOTE Confidence: 0.99778587

00:17:43.494 --> 00:17:44.955 response to this fearful,
NOTE Confidence: 0.98666286

00:17:45.494 --> 00:17:47.335 go, and that's linked with
NOTE Confidence: 0.98666286

00:17:47.335 --> 00:17:49.655 worse emotional processing outside of
NOTE Confidence: 0.98666286

00:17:49.655 --> 00:17:50.395 the scanner.
NOTE Confidence: 0.99319255

00:17:50.935 --> 00:17:52.295 And we're beginning to think
NOTE Confidence: 0.99319255

00:17:52.295 --> 00:17:53.755 of this as per perhaps
NOTE Confidence: 0.99319255

00:17:53.895 --> 00:17:55.655 kind of some biological evidence
NOTE Confidence: 0.99319255

00:17:55.655 --> 00:17:57.355 of some emotional numbing.
NOTE Confidence: 0.9851599

00:17:58.340 --> 00:17:59.140 And I'd love to talk

NOTE Confidence: 0.9851599
00:17:59.140 --> 00:18:00.020 to you guys more about
NOTE Confidence: 0.9851599
00:18:00.020 --> 00:18:00.900 that because I know you've
NOTE Confidence: 0.9851599
00:18:00.900 --> 00:18:02.680 looked into this concept in,
NOTE Confidence: 0.9996601
00:18:03.380 --> 00:18:05.240 people with PTSD diagnosis.
NOTE Confidence: 0.94948494
00:18:07.460 --> 00:18:08.920 On the other side,
NOTE Confidence: 0.9990403
00:18:09.300 --> 00:18:10.580 we wanted to look at
NOTE Confidence: 0.9990403
00:18:10.580 --> 00:18:11.640 the happy faces
NOTE Confidence: 0.95377576
00:18:12.165 --> 00:18:13.205 because we think of this
NOTE Confidence: 0.95377576
00:18:13.205 --> 00:18:14.505 as kind of a reward
NOTE Confidence: 0.95377576
00:18:14.645 --> 00:18:16.325 processing task. This is an
NOTE Confidence: 0.95377576
00:18:16.325 --> 00:18:17.545 appetitive cue.
NOTE Confidence: 0.9709147
00:18:18.325 --> 00:18:19.525 And what we, so we
NOTE Confidence: 0.9709147
00:18:19.525 --> 00:18:20.985 looked at the ventral striatum
NOTE Confidence: 0.9709147
00:18:21.125 --> 00:18:22.645 specifically and then also whole
NOTE Confidence: 0.9709147
00:18:22.645 --> 00:18:23.545 brain response.
NOTE Confidence: 0.9908385

00:18:24.030 --> 00:18:25.150 And what we see is
NOTE Confidence: 0.9908385

00:18:25.150 --> 00:18:26.910 the cannabis users in the
NOTE Confidence: 0.9908385

00:18:26.910 --> 00:18:29.090 whole brain analysis have increased
NOTE Confidence: 0.9908385

00:18:29.150 --> 00:18:30.670 bold response in the left
NOTE Confidence: 0.9908385

00:18:30.670 --> 00:18:31.170 cingulum
NOTE Confidence: 0.9719125

00:18:31.869 --> 00:18:33.630 and and diminished response in
NOTE Confidence: 0.9719125

00:18:33.630 --> 00:18:35.170 the left pre SMA.
NOTE Confidence: 0.9988875

00:18:36.045 --> 00:18:37.185 When we look specifically
NOTE Confidence: 0.9751655

00:18:37.565 --> 00:18:39.005 at the ventral striatum, we
NOTE Confidence: 0.9751655

00:18:39.005 --> 00:18:41.025 see an exaggerated or increased
NOTE Confidence: 0.9751655

00:18:41.085 --> 00:18:42.925 bold response to this reward
NOTE Confidence: 0.9751655

00:18:42.925 --> 00:18:43.425 stimuli.
NOTE Confidence: 0.99945563

00:18:44.125 --> 00:18:45.805 And that's, you know, pretty
NOTE Confidence: 0.99945563

00:18:45.805 --> 00:18:46.305 consistent
NOTE Confidence: 0.938615

00:18:46.605 --> 00:18:47.405 with the,
NOTE Confidence: 0.9631737

00:18:48.570 --> 00:18:51.210 other reward type processing tasks

NOTE Confidence: 0.9631737
00:18:51.210 --> 00:18:52.350 or cue reactivity
NOTE Confidence: 0.9808906
00:18:52.650 --> 00:18:54.169 that you see in cannabis
NOTE Confidence: 0.9808906
00:18:54.169 --> 00:18:56.590 users, either adolescents or adults.
NOTE Confidence: 0.9466624
00:18:57.289 --> 00:18:58.730 So we see kinda similar
NOTE Confidence: 0.9466624
00:18:58.730 --> 00:18:59.710 findings here.
NOTE Confidence: 0.98690945
00:19:00.955 --> 00:19:02.075 Where it got kind of
NOTE Confidence: 0.98690945
00:19:02.075 --> 00:19:03.294 interesting is
NOTE Confidence: 0.9119171
00:19:03.914 --> 00:19:05.294 when there is the interplay
NOTE Confidence: 0.9998834
00:19:05.595 --> 00:19:06.095 between
NOTE Confidence: 0.9401771
00:19:06.715 --> 00:19:08.875 processing the happy faces but
NOTE Confidence: 0.9401771
00:19:08.875 --> 00:19:10.815 having to engage the inhibitory
NOTE Confidence: 0.9401771
00:19:10.955 --> 00:19:13.195 controlled network, so having to
NOTE Confidence: 0.9401771
00:19:13.195 --> 00:19:15.054 no go on happy faces,
NOTE Confidence: 0.9691878
00:19:15.890 --> 00:19:17.650 We see this diminished bold
NOTE Confidence: 0.9691878
00:19:17.650 --> 00:19:19.350 response in the left superior
NOTE Confidence: 0.9691878

00:19:19.410 --> 00:19:20.310 frontal region.
NOTE Confidence: 0.99505424

00:19:21.250 --> 00:19:22.950 And this is typically seen
NOTE Confidence: 0.9621433

00:19:23.330 --> 00:19:24.930 like, in hap healthy adolescents,
NOTE Confidence: 0.9621433

00:19:24.930 --> 00:19:26.210 what you typically see is
NOTE Confidence: 0.9621433

00:19:26.210 --> 00:19:28.070 more recruitment of the prefrontal
NOTE Confidence: 0.9621433

00:19:28.210 --> 00:19:30.310 area with these appetitive faces.
NOTE Confidence: 0.999241

00:19:31.005 --> 00:19:32.045 And so we're wondering if
NOTE Confidence: 0.999241

00:19:32.045 --> 00:19:33.325 this might be signaling a
NOTE Confidence: 0.999241

00:19:33.325 --> 00:19:34.525 little bit less of that
NOTE Confidence: 0.999241

00:19:34.525 --> 00:19:35.744 top down prefrontal
NOTE Confidence: 0.9793501

00:19:36.045 --> 00:19:36.545 control.
NOTE Confidence: 0.9980239

00:19:38.045 --> 00:19:39.585 And when we look specifically
NOTE Confidence: 0.9980239

00:19:39.645 --> 00:19:41.005 at the ventral striatum, we
NOTE Confidence: 0.9980239

00:19:41.005 --> 00:19:42.225 actually see blunted
NOTE Confidence: 0.9987471

00:19:42.780 --> 00:19:44.320 response. So there's a disruption
NOTE Confidence: 0.9987471

00:19:44.540 --> 00:19:46.080 to that reward processing

NOTE Confidence: 0.96694446
00:19:46.540 --> 00:19:47.900 when they're having to engage
NOTE Confidence: 0.96694446
00:19:47.900 --> 00:19:49.119 in the in their inhibitory
NOTE Confidence: 0.96694446
00:19:49.340 --> 00:19:49.840 control.
NOTE Confidence: 0.96582216
00:19:51.500 --> 00:19:53.020 Notably, for all of these
NOTE Confidence: 0.96582216
00:19:53.020 --> 00:19:54.240 studies thus far,
NOTE Confidence: 0.9876334
00:19:55.340 --> 00:19:56.380 we don't know for sure
NOTE Confidence: 0.9876334
00:19:56.380 --> 00:19:57.440 if this is a consequence
NOTE Confidence: 0.9918564
00:19:58.105 --> 00:19:59.865 of their repeated cannabis use
NOTE Confidence: 0.9918564
00:19:59.865 --> 00:20:01.384 or a risk factor for
NOTE Confidence: 0.9918564
00:20:01.384 --> 00:20:02.825 heavy cannabis use. So that's
NOTE Confidence: 0.9918564
00:20:02.825 --> 00:20:03.945 something that we really need
NOTE Confidence: 0.9918564
00:20:03.945 --> 00:20:04.904 to look at in the
NOTE Confidence: 0.9918564
00:20:04.904 --> 00:20:05.884 in the longitudinal
NOTE Confidence: 0.9996187
00:20:06.264 --> 00:20:06.764 design.
NOTE Confidence: 0.9996519
00:20:09.304 --> 00:20:10.664 I wanted to highlight a
NOTE Confidence: 0.9996519

00:20:10.664 --> 00:20:11.164 few
NOTE Confidence: 0.9921854

00:20:11.840 --> 00:20:13.840 of our resting state functional
NOTE Confidence: 0.9921854

00:20:13.840 --> 00:20:14.340 connectivity.
NOTE Confidence: 0.9992208

00:20:14.720 --> 00:20:16.160 So for those of you
NOTE Confidence: 0.9992208

00:20:16.160 --> 00:20:17.680 who don't do imaging work,
NOTE Confidence: 0.9992208

00:20:17.680 --> 00:20:18.640 this is when,
NOTE Confidence: 0.9850416

00:20:19.040 --> 00:20:20.640 the teenagers or young adults
NOTE Confidence: 0.9850416

00:20:20.640 --> 00:20:22.000 are just at rest. So
NOTE Confidence: 0.9850416

00:20:22.000 --> 00:20:23.700 they're relaxing in the scanner,
NOTE Confidence: 0.9864983

00:20:24.085 --> 00:20:25.925 and we're just recording what
NOTE Confidence: 0.9864983

00:20:25.925 --> 00:20:27.525 their, brain is doing in
NOTE Confidence: 0.9864983

00:20:27.525 --> 00:20:28.885 kind of the natural state
NOTE Confidence: 0.9864983

00:20:28.885 --> 00:20:29.945 or at rest.
NOTE Confidence: 0.9667785

00:20:30.885 --> 00:20:32.565 The first analysis looked at
NOTE Confidence: 0.9667785

00:20:32.565 --> 00:20:34.325 the default mode network at
NOTE Confidence: 0.9667785

00:20:34.325 --> 00:20:35.785 rest. And, typically,

NOTE Confidence: 0.97556067
00:20:36.700 --> 00:20:37.580 there's a few different ways
NOTE Confidence: 0.97556067
00:20:37.580 --> 00:20:38.859 you can analyze this. For
NOTE Confidence: 0.97556067
00:20:38.859 --> 00:20:40.220 for these studies, we we
NOTE Confidence: 0.97556067
00:20:40.220 --> 00:20:41.840 did a seed based analysis.
NOTE Confidence: 0.97556067
00:20:41.900 --> 00:20:43.119 So we kinda picked
NOTE Confidence: 0.9709086
00:20:43.420 --> 00:20:45.020 a hub of the neural
NOTE Confidence: 0.9709086
00:20:45.020 --> 00:20:46.460 network that we were interested
NOTE Confidence: 0.9709086
00:20:46.460 --> 00:20:48.140 in and saw how it
NOTE Confidence: 0.9709086
00:20:48.140 --> 00:20:49.900 was kind of correlated or
NOTE Confidence: 0.9709086
00:20:49.900 --> 00:20:50.400 coactivating
NOTE Confidence: 0.9993898
00:20:50.780 --> 00:20:51.920 with other areas.
NOTE Confidence: 0.9889778
00:20:53.025 --> 00:20:54.305 In the default mode network,
NOTE Confidence: 0.9889778
00:20:54.305 --> 00:20:55.845 which is that self differential
NOTE Confidence: 0.9889778
00:20:56.065 --> 00:20:58.565 network, we see actually diminished
NOTE Confidence: 0.9841566
00:20:59.345 --> 00:21:00.645 intranetwork connectivity.
NOTE Confidence: 0.99900824

00:21:00.945 --> 00:21:01.445 So
NOTE Confidence: 0.9482225

00:21:01.985 --> 00:21:03.744 the posterior cingulate in this
NOTE Confidence: 0.9482225

00:21:03.744 --> 00:21:05.410 case is the seed, and
NOTE Confidence: 0.9482225

00:21:05.410 --> 00:21:06.550 we saw diminished,
NOTE Confidence: 0.9948936

00:21:07.170 --> 00:21:08.710 connectivity with the precuneus
NOTE Confidence: 0.8949906

00:21:09.170 --> 00:21:10.790 and the hessicles and parahippocampal
NOTE Confidence: 0.7408268

00:21:12.050 --> 00:21:12.550 gyri,
NOTE Confidence: 0.9640766

00:21:13.170 --> 00:21:14.770 and then actually some kind
NOTE Confidence: 0.9640766

00:21:14.770 --> 00:21:17.490 of abnormal increased connectivity between
NOTE Confidence: 0.9640766

00:21:17.490 --> 00:21:19.590 the posterior cingulate and cerebellar
NOTE Confidence: 0.9640766

00:21:19.730 --> 00:21:20.230 regions.
NOTE Confidence: 0.9961374

00:21:20.565 --> 00:21:22.325 So the cerebellum usually isn't
NOTE Confidence: 0.9961374

00:21:22.325 --> 00:21:23.684 part of that default mode
NOTE Confidence: 0.9961374

00:21:23.684 --> 00:21:24.184 network.
NOTE Confidence: 0.9976128

00:21:25.284 --> 00:21:26.825 This pattern of,
NOTE Confidence: 0.9715256

00:21:27.445 --> 00:21:30.424 diminished intranetwork and increased intranetwork

NOTE Confidence: 0.9715256

00:21:30.644 --> 00:21:31.144 connectivity

NOTE Confidence: 0.97794366

00:21:31.445 --> 00:21:33.544 was related to poor selective

NOTE Confidence: 0.97794366

00:21:33.684 --> 00:21:35.304 attention and verbal memory,

NOTE Confidence: 0.97697014

00:21:35.809 --> 00:21:37.169 and these are cognitive tasks

NOTE Confidence: 0.97697014

00:21:37.169 --> 00:21:38.309 that we see oftentimes

NOTE Confidence: 0.97107685

00:21:38.770 --> 00:21:40.450 impaired in the cannabis users,

NOTE Confidence: 0.97107685

00:21:40.450 --> 00:21:41.750 including in the sample.

NOTE Confidence: 0.97137564

00:21:43.570 --> 00:21:45.010 Next, we're interested in the

NOTE Confidence: 0.97137564

00:21:45.010 --> 00:21:46.690 dorsal attention network because that's

NOTE Confidence: 0.97137564

00:21:46.690 --> 00:21:48.470 a top down attention network

NOTE Confidence: 0.99395853

00:21:48.855 --> 00:21:50.135 that has been linked with

NOTE Confidence: 0.99395853

00:21:50.135 --> 00:21:51.975 things like selective attention and

NOTE Confidence: 0.99395853

00:21:51.975 --> 00:21:53.115 sustained attention.

NOTE Confidence: 0.97182167

00:21:53.734 --> 00:21:54.855 And what we found was,

NOTE Confidence: 0.97182167

00:21:54.855 --> 00:21:55.915 again, reduced,
NOTE Confidence: 0.82635856

00:21:56.775 --> 00:21:57.994 intra network connectivity
NOTE Confidence: 0.9794098

00:21:58.295 --> 00:22:00.295 between the right inferior parietal
NOTE Confidence: 0.9794098

00:22:00.295 --> 00:22:02.475 region and the anterior insula.
NOTE Confidence: 0.97789484

00:22:03.560 --> 00:22:05.100 And this pattern of diminished
NOTE Confidence: 0.97789484

00:22:05.240 --> 00:22:05.740 connectivity
NOTE Confidence: 0.9963566

00:22:06.040 --> 00:22:07.720 was linked with increased cannabis
NOTE Confidence: 0.9963566

00:22:07.720 --> 00:22:09.180 use in the past year,
NOTE Confidence: 0.9963566

00:22:09.400 --> 00:22:11.160 shorter periods of abstinence, and
NOTE Confidence: 0.9963566

00:22:11.160 --> 00:22:13.160 increased symptoms of cannabis use
NOTE Confidence: 0.9963566

00:22:13.160 --> 00:22:13.660 disorder.
NOTE Confidence: 0.9813405

00:22:15.315 --> 00:22:16.994 And finally, the, we looked
NOTE Confidence: 0.9813405

00:22:16.994 --> 00:22:18.994 at relationships between frontal and
NOTE Confidence: 0.9813405

00:22:18.994 --> 00:22:20.674 limbic networks because, again, we're
NOTE Confidence: 0.9813405

00:22:20.674 --> 00:22:21.875 kind of interested in this
NOTE Confidence: 0.9813405

00:22:21.875 --> 00:22:22.375 interplay

NOTE Confidence: 0.99363446
00:22:23.154 --> 00:22:25.414 between executive functioning and affective
NOTE Confidence: 0.99363446
00:22:25.475 --> 00:22:25.975 regulation
NOTE Confidence: 0.9831004
00:22:27.040 --> 00:22:29.040 and found actually evidence of
NOTE Confidence: 0.9831004
00:22:29.040 --> 00:22:30.020 increased connectivity
NOTE Confidence: 0.99599254
00:22:30.560 --> 00:22:31.060 between,
NOTE Confidence: 0.89080226
00:22:32.080 --> 00:22:33.680 the right and a rostral
NOTE Confidence: 0.89080226
00:22:33.680 --> 00:22:35.840 anterior cingulate, the bilateral kind
NOTE Confidence: 0.89080226
00:22:35.840 --> 00:22:37.200 of relationship as well as
NOTE Confidence: 0.89080226
00:22:37.200 --> 00:22:38.340 with the left amygdala
NOTE Confidence: 0.982277
00:22:38.800 --> 00:22:40.535 and the left insula, so
NOTE Confidence: 0.982277
00:22:40.535 --> 00:22:41.975 other areas within this kind
NOTE Confidence: 0.982277
00:22:41.975 --> 00:22:43.835 of emotion regulation network.
NOTE Confidence: 0.9921742
00:22:44.695 --> 00:22:46.855 And this increased connectivity at
NOTE Confidence: 0.9921742
00:22:46.855 --> 00:22:47.355 rest
NOTE Confidence: 0.99869335
00:22:47.815 --> 00:22:49.755 was linked with increased depressive
NOTE Confidence: 0.99869335

00:22:49.895 --> 00:22:51.734 symptoms, which we've also seen
NOTE Confidence: 0.99869335

00:22:51.734 --> 00:22:52.875 kind of in the depression
NOTE Confidence: 0.99869335

00:22:53.015 --> 00:22:53.515 literature.
NOTE Confidence: 0.9992868

00:22:54.750 --> 00:22:55.250 Notably,
NOTE Confidence: 0.95888096

00:22:55.710 --> 00:22:57.150 the sample did not have
NOTE Confidence: 0.95888096

00:22:57.150 --> 00:22:58.690 diagnoses of depression.
NOTE Confidence: 0.99871814

00:23:00.270 --> 00:23:01.170 Okay. So
NOTE Confidence: 0.9987631

00:23:02.030 --> 00:23:03.490 this pattern of results,
NOTE Confidence: 0.9866756

00:23:04.109 --> 00:23:05.790 overall made us start thinking,
NOTE Confidence: 0.9866756

00:23:05.790 --> 00:23:07.115 you know, but this is
NOTE Confidence: 0.9866756

00:23:07.115 --> 00:23:09.435 interesting within these specific networks,
NOTE Confidence: 0.9866756

00:23:09.435 --> 00:23:10.635 but it's a little limited
NOTE Confidence: 0.9866756

00:23:10.635 --> 00:23:11.595 because we're only looking at
NOTE Confidence: 0.9866756

00:23:11.595 --> 00:23:12.895 one network at a time.
NOTE Confidence: 0.9866756

00:23:13.035 --> 00:23:14.575 What about intrinsic connectivity
NOTE Confidence: 0.9983363

00:23:15.115 --> 00:23:16.095 across networks?

NOTE Confidence: 0.87682426

00:23:17.035 --> 00:23:18.075 So one of my current

NOTE Confidence: 0.87682426

00:23:18.075 --> 00:23:19.695 graduate students, Cal Baike,

NOTE Confidence: 0.94824934

00:23:20.650 --> 00:23:21.470 noted here,

NOTE Confidence: 0.997324

00:23:22.170 --> 00:23:23.869 wanted to use more network

NOTE Confidence: 0.997324

00:23:23.929 --> 00:23:26.109 topology and network based statistics

NOTE Confidence: 0.99759257

00:23:26.410 --> 00:23:27.450 to look at the impact

NOTE Confidence: 0.99759257

00:23:27.450 --> 00:23:28.910 of cannabis on,

NOTE Confidence: 0.8951825

00:23:30.090 --> 00:23:31.230 intrinsic conductivity

NOTE Confidence: 0.9880757

00:23:31.609 --> 00:23:33.530 at rest across multiple networks

NOTE Confidence: 0.9880757

00:23:33.530 --> 00:23:34.030 simultaneously.

NOTE Confidence: 0.9839618

00:23:35.524 --> 00:23:37.605 Just to, highlight a couple

NOTE Confidence: 0.9839618

00:23:37.605 --> 00:23:39.044 of terms that I'm gonna

NOTE Confidence: 0.9839618

00:23:39.044 --> 00:23:40.265 be referring to,

NOTE Confidence: 0.9726155

00:23:41.765 --> 00:23:43.365 so this network topology is

NOTE Confidence: 0.9726155

00:23:43.365 --> 00:23:44.725 really looking at the functional

NOTE Confidence: 0.9726155

00:23:44.725 --> 00:23:45.924 brain activity, look
NOTE Confidence: 0.94043857

00:23:46.644 --> 00:23:48.345 highlighting the flow of information.
NOTE Confidence: 0.9997121

00:23:49.350 --> 00:23:50.330 Global efficiency
NOTE Confidence: 0.9782891

00:23:50.710 --> 00:23:52.630 refers to, for the most
NOTE Confidence: 0.9782891

00:23:52.630 --> 00:23:54.410 part, global strength of connections
NOTE Confidence: 0.9782891

00:23:54.710 --> 00:23:56.650 or representing how quickly information
NOTE Confidence: 0.9782891

00:23:56.710 --> 00:23:58.010 can flow in a network.
NOTE Confidence: 0.95633435

00:23:58.550 --> 00:24:00.150 And a sortativity is the
NOTE Confidence: 0.95633435

00:24:00.150 --> 00:24:01.590 degree to which nodes are
NOTE Confidence: 0.95633435

00:24:01.590 --> 00:24:02.950 more likely to be neighbors
NOTE Confidence: 0.95633435

00:24:02.950 --> 00:24:04.395 with similar nodes or
NOTE Confidence: 0.99852604

00:24:04.715 --> 00:24:05.915 might represent more of a
NOTE Confidence: 0.99852604

00:24:05.915 --> 00:24:07.615 degree or clustering coefficient.
NOTE Confidence: 0.9957486

00:24:09.515 --> 00:24:10.655 The, intrinsic
NOTE Confidence: 0.9940766

00:24:10.955 --> 00:24:12.395 networks that we are interested
NOTE Confidence: 0.9940766

00:24:12.395 --> 00:24:13.915 in are the frontal parietal

NOTE Confidence: 0.9940766
00:24:13.915 --> 00:24:16.095 control network, which underlies executive
NOTE Confidence: 0.9940766
00:24:16.234 --> 00:24:17.535 functioning and planning,
NOTE Confidence: 0.84156007
00:24:18.529 --> 00:24:20.549 to some extent working memory,
NOTE Confidence: 0.9733843
00:24:21.169 --> 00:24:22.770 the ventral attention network, which
NOTE Confidence: 0.9733843
00:24:22.770 --> 00:24:24.230 is more bottom up attention,
NOTE Confidence: 0.9733843
00:24:24.289 --> 00:24:25.970 and that dorsal attention network,
NOTE Confidence: 0.9733843
00:24:25.970 --> 00:24:27.570 which is top down, the
NOTE Confidence: 0.9733843
00:24:27.570 --> 00:24:28.850 default mode network, which is
NOTE Confidence: 0.9733843
00:24:28.850 --> 00:24:31.190 that self self referential network.
NOTE Confidence: 0.9733843
00:24:31.365 --> 00:24:32.244 And then we also add
NOTE Confidence: 0.9733843
00:24:32.244 --> 00:24:33.605 in the somatic motor network
NOTE Confidence: 0.9733843
00:24:33.605 --> 00:24:35.365 because there's some evidence of
NOTE Confidence: 0.9733843
00:24:35.365 --> 00:24:37.465 abnormalities in cannabis users there.
NOTE Confidence: 0.9347594
00:24:40.325 --> 00:24:41.445 Overall, when we looked at
NOTE Confidence: 0.9347594
00:24:41.445 --> 00:24:43.205 the network topology, so that
NOTE Confidence: 0.9347594

00:24:43.205 --> 00:24:43.705 assortativity
NOTE Confidence: 0.9420551

00:24:44.165 --> 00:24:44.645 and,
NOTE Confidence: 0.9763693

00:24:45.280 --> 00:24:47.440 global efficiency measures, we saw
NOTE Confidence: 0.9763693

00:24:47.440 --> 00:24:49.359 that just cannabis group status
NOTE Confidence: 0.9763693

00:24:49.359 --> 00:24:50.980 was not significantly linked,
NOTE Confidence: 0.9798816

00:24:51.600 --> 00:24:53.140 but more of the nuanced
NOTE Confidence: 0.9798816

00:24:53.280 --> 00:24:55.220 measures of cannabis use, including
NOTE Confidence: 0.9798816

00:24:55.440 --> 00:24:56.500 past year dose,
NOTE Confidence: 0.94323254

00:24:56.800 --> 00:24:58.155 the sex of the user,
NOTE Confidence: 0.94323254

00:24:58.215 --> 00:24:59.415 age of onset, and length
NOTE Confidence: 0.94323254

00:24:59.415 --> 00:25:01.755 of abstinence were significantly related.
NOTE Confidence: 0.9632306

00:25:02.855 --> 00:25:03.994 So more specifically,
NOTE Confidence: 0.91039175

00:25:05.895 --> 00:25:07.675 past year cannabis use,
NOTE Confidence: 0.99553305

00:25:08.775 --> 00:25:10.455 was so increased past year
NOTE Confidence: 0.99553305

00:25:10.455 --> 00:25:12.234 use was linked with increased
NOTE Confidence: 0.99553305

00:25:12.490 --> 00:25:13.309 global efficiency

NOTE Confidence: 0.9688213

00:25:13.690 --> 00:25:15.609 in that frontal parietal control

NOTE Confidence: 0.9688213

00:25:15.609 --> 00:25:16.109 network.

NOTE Confidence: 0.9862643

00:25:16.570 --> 00:25:18.250 And this was primarily driven

NOTE Confidence: 0.9862643

00:25:18.250 --> 00:25:19.929 by the male cannabis users

NOTE Confidence: 0.9862643

00:25:19.929 --> 00:25:20.970 as we did see a

NOTE Confidence: 0.9862643

00:25:20.970 --> 00:25:22.109 significant interaction.

NOTE Confidence: 0.95184493

00:25:22.970 --> 00:25:24.409 And we found that in

NOTE Confidence: 0.95184493

00:25:24.409 --> 00:25:26.250 those male users, past year

NOTE Confidence: 0.95184493

00:25:26.250 --> 00:25:28.325 use was also related to

NOTE Confidence: 0.95184493

00:25:28.325 --> 00:25:30.165 increased global efficiency in the

NOTE Confidence: 0.95184493

00:25:30.165 --> 00:25:32.505 van network and increased assertivity

NOTE Confidence: 0.95184493

00:25:32.725 --> 00:25:34.265 in the somatic motor network.

NOTE Confidence: 0.9992612

00:25:35.765 --> 00:25:36.725 We found in the whole

NOTE Confidence: 0.9992612

00:25:36.725 --> 00:25:38.165 sample that a shorter length

NOTE Confidence: 0.9992612

00:25:38.165 --> 00:25:39.945 of abstinence from cannabis

NOTE Confidence: 0.98831695

00:25:40.700 --> 00:25:42.540 was related to increased whole
NOTE Confidence: 0.98831695

00:25:42.540 --> 00:25:43.900 brain as well as,
NOTE Confidence: 0.95185566

00:25:44.300 --> 00:25:46.160 ventral attention network assertivity.
NOTE Confidence: 0.99714684

00:25:47.420 --> 00:25:48.540 And there was this kind
NOTE Confidence: 0.99714684

00:25:48.540 --> 00:25:49.520 of small caveat
NOTE Confidence: 0.9579583

00:25:50.380 --> 00:25:51.980 of within, again, the male
NOTE Confidence: 0.9579583

00:25:51.980 --> 00:25:52.960 cannabis users
NOTE Confidence: 0.8963726

00:25:53.420 --> 00:25:54.859 in earlier of age of
NOTE Confidence: 0.8963726

00:25:54.859 --> 00:25:55.359 onset
NOTE Confidence: 0.9990875

00:25:55.945 --> 00:25:58.125 was actually linked with decreased
NOTE Confidence: 0.97543496

00:25:58.425 --> 00:26:00.525 ventral attention and somatic motor,
NOTE Confidence: 0.85235643

00:26:01.065 --> 00:26:02.125 network assertivity.
NOTE Confidence: 0.9984679

00:26:03.865 --> 00:26:04.365 Generally,
NOTE Confidence: 0.9936463

00:26:05.065 --> 00:26:06.345 the effect sizes were in
NOTE Confidence: 0.9936463

00:26:06.345 --> 00:26:08.505 the medium range, though they
NOTE Confidence: 0.9936463

00:26:08.505 --> 00:26:10.605 ranged from small to large.

NOTE Confidence: 0.9895347
00:26:13.369 --> 00:26:14.970 The next step was to
NOTE Confidence: 0.9895347
00:26:14.970 --> 00:26:16.490 look at the network based
NOTE Confidence: 0.9895347
00:26:16.490 --> 00:26:17.850 statistics, and so we could
NOTE Confidence: 0.9895347
00:26:17.850 --> 00:26:19.150 use kind of continuous,
NOTE Confidence: 0.9999611
00:26:20.570 --> 00:26:21.070 predictors
NOTE Confidence: 0.91094595
00:26:21.450 --> 00:26:23.790 of of inter and intra
NOTE Confidence: 0.91094595
00:26:23.850 --> 00:26:24.350 network,
NOTE Confidence: 0.8964547
00:26:24.970 --> 00:26:25.395 net,
NOTE Confidence: 0.99273443
00:26:25.795 --> 00:26:27.655 edges and strength of connections.
NOTE Confidence: 0.9392869
00:26:28.355 --> 00:26:29.475 And what we found again
NOTE Confidence: 0.9392869
00:26:29.475 --> 00:26:30.515 is that it really was
NOTE Confidence: 0.9392869
00:26:30.515 --> 00:26:31.875 past year use was the
NOTE Confidence: 0.9392869
00:26:31.875 --> 00:26:32.775 most robust,
NOTE Confidence: 0.99149066
00:26:33.555 --> 00:26:34.935 and consistent predictor.
NOTE Confidence: 0.96763086
00:26:35.395 --> 00:26:37.315 So increased use was related
NOTE Confidence: 0.96763086

00:26:37.315 --> 00:26:38.535 to increased connectivity.
NOTE Confidence: 0.9588225

00:26:39.490 --> 00:26:40.789 And this was primarily
NOTE Confidence: 0.9993534

00:26:41.090 --> 00:26:42.710 between network edges
NOTE Confidence: 0.9356249

00:26:43.330 --> 00:26:45.090 between the van, the default
NOTE Confidence: 0.9356249

00:26:45.090 --> 00:26:47.010 mode network, the frontal parietal,
NOTE Confidence: 0.9356249

00:26:47.010 --> 00:26:48.690 and the somatic motor networks,
NOTE Confidence: 0.9356249

00:26:48.690 --> 00:26:50.149 and this occurred at multiple
NOTE Confidence: 0.9356249

00:26:50.210 --> 00:26:50.710 thresholds.
NOTE Confidence: 0.952457

00:26:51.755 --> 00:26:53.675 Although we couldn't examine sex
NOTE Confidence: 0.952457

00:26:53.675 --> 00:26:55.355 effects, it's notable that the
NOTE Confidence: 0.952457

00:26:55.355 --> 00:26:57.275 prior ICN analyses was more
NOTE Confidence: 0.952457

00:26:57.275 --> 00:26:58.655 consistent in the males.
NOTE Confidence: 0.9730536

00:26:58.955 --> 00:27:00.235 So we suspect that this
NOTE Confidence: 0.9730536

00:27:00.235 --> 00:27:02.095 is primarily driven by them.
NOTE Confidence: 0.99367344

00:27:03.195 --> 00:27:04.840 We kinda look in. One
NOTE Confidence: 0.99367344

00:27:04.840 --> 00:27:06.119 thing that's notable that I

NOTE Confidence: 0.99367344

00:27:06.119 --> 00:27:07.480 haven't really seen much in

NOTE Confidence: 0.99367344

00:27:07.480 --> 00:27:08.139 the literature

NOTE Confidence: 0.979409

00:27:08.759 --> 00:27:10.119 is that there seems to

NOTE Confidence: 0.979409

00:27:10.119 --> 00:27:11.320 be this kind of almost

NOTE Confidence: 0.979409

00:27:11.320 --> 00:27:13.960 right hemisphere dominance pattern for

NOTE Confidence: 0.979409

00:27:13.960 --> 00:27:15.159 one thing. Although, you know,

NOTE Confidence: 0.979409

00:27:15.159 --> 00:27:16.119 it's seen in the left

NOTE Confidence: 0.979409

00:27:16.119 --> 00:27:17.205 and right, but that that

NOTE Confidence: 0.979409

00:27:17.205 --> 00:27:18.244 just kind of stood out

NOTE Confidence: 0.979409

00:27:18.244 --> 00:27:18.904 to me.

NOTE Confidence: 0.9991318

00:27:19.684 --> 00:27:20.965 And a lot of this,

NOTE Confidence: 0.9434987

00:27:21.445 --> 00:27:23.765 inter network functional coupling, there's

NOTE Confidence: 0.9434987

00:27:23.765 --> 00:27:25.465 a lot of overlap within

NOTE Confidence: 0.9434987

00:27:25.605 --> 00:27:28.565 that, interior cingulate region, which

NOTE Confidence: 0.9434987

00:27:28.565 --> 00:27:30.005 which is a part of

NOTE Confidence: 0.9434987

00:27:30.005 --> 00:27:31.304 several of these networks.
NOTE Confidence: 0.99583584

00:27:32.050 --> 00:27:33.490 It's notable that this is
NOTE Confidence: 0.99583584

00:27:33.490 --> 00:27:34.609 after that two to three
NOTE Confidence: 0.99583584

00:27:34.609 --> 00:27:35.750 weeks of abstinence,
NOTE Confidence: 0.9993569

00:27:36.130 --> 00:27:37.890 and we're interpreting this as
NOTE Confidence: 0.9993569

00:27:37.890 --> 00:27:39.590 a more disorganized connectome
NOTE Confidence: 0.9657999

00:27:40.450 --> 00:27:42.530 potentially due to this, you
NOTE Confidence: 0.9657999

00:27:42.530 --> 00:27:44.390 know, multiple hits of exogenous
NOTE Confidence: 0.9785536

00:27:44.770 --> 00:27:47.109 cannabis exposure, which might disrupt
NOTE Confidence: 0.9798779

00:27:47.625 --> 00:27:48.605 kind of the GABA
NOTE Confidence: 0.7630672

00:27:49.145 --> 00:27:50.045 glutamate balance
NOTE Confidence: 0.909042

00:27:50.425 --> 00:27:52.445 and, excite you know,
NOTE Confidence: 0.91669977

00:27:53.785 --> 00:27:55.005 excitation levels
NOTE Confidence: 0.98533225

00:27:55.545 --> 00:27:56.945 and create connections that are
NOTE Confidence: 0.98533225

00:27:56.945 --> 00:27:57.885 a bit artificial.
NOTE Confidence: 0.9944555

00:27:58.825 --> 00:28:00.720 It might also represent increased

NOTE Confidence: 0.9944555
00:28:00.960 --> 00:28:03.440 switching between networks at a
NOTE Confidence: 0.9944555
00:28:03.440 --> 00:28:05.039 restful state, and so these
NOTE Confidence: 0.9944555
00:28:05.039 --> 00:28:06.240 are areas that we wanna
NOTE Confidence: 0.9944555
00:28:06.240 --> 00:28:07.460 continue to look into.
NOTE Confidence: 0.9506217
00:28:12.080 --> 00:28:13.220 So I don't know.
NOTE Confidence: 0.96064556
00:28:14.885 --> 00:28:16.005 One thing that we discussed
NOTE Confidence: 0.96064556
00:28:16.005 --> 00:28:18.005 is potentially asking questions kind
NOTE Confidence: 0.96064556
00:28:18.005 --> 00:28:19.385 of at midway points.
NOTE Confidence: 0.9997772
00:28:19.925 --> 00:28:20.985 I don't know if
NOTE Confidence: 0.95046586
00:28:21.365 --> 00:28:23.125 this is Yeah. Actually, Krista,
NOTE Confidence: 0.95046586
00:28:23.125 --> 00:28:24.005 I had put in a
NOTE Confidence: 0.95046586
00:28:24.005 --> 00:28:25.205 a question in the chat.
NOTE Confidence: 0.95046586
00:28:25.205 --> 00:28:26.744 Okay. I'm sure you were
NOTE Confidence: 0.95046586
00:28:26.899 --> 00:28:28.659 you were, focusing on your
NOTE Confidence: 0.95046586
00:28:28.659 --> 00:28:29.159 presentation.
NOTE Confidence: 0.9800964

00:28:29.460 --> 00:28:30.740 The question I had for
NOTE Confidence: 0.9800964

00:28:30.740 --> 00:28:31.480 you was,
NOTE Confidence: 0.9587908

00:28:32.259 --> 00:28:34.179 so it sounds like if
NOTE Confidence: 0.9587908

00:28:34.179 --> 00:28:35.380 if I read your first
NOTE Confidence: 0.9587908

00:28:35.380 --> 00:28:36.200 slide correctly,
NOTE Confidence: 0.7546906

00:28:38.820 --> 00:28:39.320 despite
NOTE Confidence: 0.99908924

00:28:39.620 --> 00:28:41.000 three weeks of abstinence,
NOTE Confidence: 0.70826626

00:28:42.015 --> 00:28:42.515 these,
NOTE Confidence: 0.9902289

00:28:44.015 --> 00:28:46.015 young adults and adolescents still
NOTE Confidence: 0.9902289

00:28:46.015 --> 00:28:46.515 showed
NOTE Confidence: 0.9538222

00:28:49.855 --> 00:28:51.955 differences in cognitive test performance.
NOTE Confidence: 0.9538222

00:28:52.015 --> 00:28:53.715 Is that is that right?
NOTE Confidence: 0.9538222

00:28:53.935 --> 00:28:55.695 That's correct. And so my
NOTE Confidence: 0.9538222

00:28:55.695 --> 00:28:56.655 question to you is, do
NOTE Confidence: 0.9538222

00:28:56.655 --> 00:28:57.135 you think it's
NOTE Confidence: 0.99877805

00:28:58.470 --> 00:28:59.990 if if you waited long

NOTE Confidence: 0.99877805

00:28:59.990 --> 00:29:00.490 enough

NOTE Confidence: 0.93836004

00:29:01.030 --> 00:29:02.010 that those

NOTE Confidence: 0.96177125

00:29:02.390 --> 00:29:02.790 those,

NOTE Confidence: 0.9913022

00:29:03.350 --> 00:29:05.429 cognitive deficits would disappear? Because

NOTE Confidence: 0.9913022

00:29:05.429 --> 00:29:06.650 in our hands, we've

NOTE Confidence: 0.99593306

00:29:07.190 --> 00:29:07.690 we've

NOTE Confidence: 0.7326621

00:29:07.990 --> 00:29:09.270 kept the dials at,

NOTE Confidence: 0.92527664

00:29:09.750 --> 00:29:10.809 abstinent for

NOTE Confidence: 0.9812854

00:29:11.855 --> 00:29:13.215 four weeks and now eight

NOTE Confidence: 0.9812854

00:29:13.215 --> 00:29:13.715 weeks.

NOTE Confidence: 0.9615725

00:29:14.415 --> 00:29:14.915 And,

NOTE Confidence: 0.9799967

00:29:15.615 --> 00:29:16.895 some of them don't recover,

NOTE Confidence: 0.9799967

00:29:16.895 --> 00:29:18.095 some of them do recover.

NOTE Confidence: 0.9799967

00:29:18.095 --> 00:29:19.715 And I I remember the,

NOTE Confidence: 0.9726191

00:29:20.175 --> 00:29:21.935 you know, important study by,

NOTE Confidence: 0.9726191

00:29:21.935 --> 00:29:23.155 I think, Pope
NOTE Confidence: 0.9178165

00:29:23.695 --> 00:29:25.350 in in when he went
NOTE Confidence: 0.9178165

00:29:25.510 --> 00:29:26.630 in the study at Mass
NOTE Confidence: 0.9178165

00:29:26.630 --> 00:29:27.850 General where they took
NOTE Confidence: 0.9854458

00:29:28.150 --> 00:29:29.910 college students and hospitalized them
NOTE Confidence: 0.9854458

00:29:29.910 --> 00:29:30.650 for a month.
NOTE Confidence: 0.9981741

00:29:31.110 --> 00:29:32.150 And at the end of
NOTE Confidence: 0.9981741

00:29:32.150 --> 00:29:33.350 twenty eight days, they didn't
NOTE Confidence: 0.9981741

00:29:33.350 --> 00:29:34.330 see any differences.
NOTE Confidence: 0.94162416

00:29:34.630 --> 00:29:35.450 So I'm curious.
NOTE Confidence: 0.5799332

00:29:36.390 --> 00:29:36.799 Do you
NOTE Confidence: 0.9808709

00:29:37.605 --> 00:29:38.885 my question is, do you
NOTE Confidence: 0.9808709

00:29:38.885 --> 00:29:40.985 expect that these deficits will
NOTE Confidence: 0.9996301

00:29:41.285 --> 00:29:42.565 go away completely if you
NOTE Confidence: 0.9996301

00:29:42.565 --> 00:29:43.865 just wait long enough?
NOTE Confidence: 0.99983853

00:29:45.125 --> 00:29:46.105 I think that's

NOTE Confidence: 0.9998798

00:29:46.405 --> 00:29:47.545 entirely possible.

NOTE Confidence: 0.9995961

00:29:48.565 --> 00:29:50.105 We do have some evidence

NOTE Confidence: 0.9995961

00:29:50.165 --> 00:29:50.405 that

NOTE Confidence: 0.99742585

00:29:51.049 --> 00:29:52.809 like, for example, the verbal

NOTE Confidence: 0.99742585

00:29:52.809 --> 00:29:53.309 memory

NOTE Confidence: 0.9605725

00:29:53.610 --> 00:29:55.450 deficits, we do see at

NOTE Confidence: 0.9605725

00:29:55.450 --> 00:29:56.909 that baseline session.

NOTE Confidence: 0.999271

00:29:57.210 --> 00:29:58.730 But by two weeks of

NOTE Confidence: 0.999271

00:29:58.730 --> 00:29:59.230 abstinence,

NOTE Confidence: 0.9984818

00:29:59.770 --> 00:30:01.630 they're they're no longer significantly

NOTE Confidence: 0.9984818

00:30:01.850 --> 00:30:02.350 different.

NOTE Confidence: 0.9790065

00:30:02.650 --> 00:30:03.850 We've also saw that type

NOTE Confidence: 0.9790065

00:30:03.850 --> 00:30:05.770 of recovery with Susan Tapert's,

NOTE Confidence: 0.9790065

00:30:05.770 --> 00:30:07.355 like, teenage data where we

NOTE Confidence: 0.9790065

00:30:07.355 --> 00:30:08.795 got we put them through

NOTE Confidence: 0.9790065

00:30:08.795 --> 00:30:10.495 a month of abstinence as
NOTE Confidence: 0.9475916

00:30:10.795 --> 00:30:12.175 well. So there is some
NOTE Confidence: 0.9475916

00:30:12.395 --> 00:30:12.895 longitudinal
NOTE Confidence: 0.99695456

00:30:13.195 --> 00:30:14.975 evidence of recovery of function.
NOTE Confidence: 0.9362443

00:30:16.715 --> 00:30:17.995 I still don't know of
NOTE Confidence: 0.9362443

00:30:17.995 --> 00:30:19.870 any studies, and there I
NOTE Confidence: 0.9362443

00:30:19.870 --> 00:30:21.549 think I've seen studies being
NOTE Confidence: 0.9362443

00:30:21.549 --> 00:30:22.750 reviewed, so I don't know.
NOTE Confidence: 0.9362443

00:30:22.750 --> 00:30:24.270 You know, I'm hoping that
NOTE Confidence: 0.9362443

00:30:24.270 --> 00:30:25.409 they'll be coming out,
NOTE Confidence: 0.9707198

00:30:26.830 --> 00:30:28.450 of repeated neuroimaging.
NOTE Confidence: 0.91495466

00:30:29.630 --> 00:30:31.390 So the the behavioral kinda
NOTE Confidence: 0.91495466

00:30:31.390 --> 00:30:31.890 downstream
NOTE Confidence: 0.9900578

00:30:32.350 --> 00:30:33.570 cognitive effects,
NOTE Confidence: 0.9992422

00:30:33.950 --> 00:30:35.649 we certainly see some recovery
NOTE Confidence: 0.99936575

00:30:36.165 --> 00:30:36.665 in

NOTE Confidence: 0.9832263
00:30:36.965 --> 00:30:37.365 those,
NOTE Confidence: 0.98711246
00:30:37.925 --> 00:30:39.365 early, you know, even within
NOTE Confidence: 0.98711246
00:30:39.365 --> 00:30:40.725 a few days to two
NOTE Confidence: 0.98711246
00:30:40.725 --> 00:30:42.585 weeks of sustained abstinence.
NOTE Confidence: 0.9760291
00:30:43.525 --> 00:30:45.045 And then what I don't
NOTE Confidence: 0.9760291
00:30:45.045 --> 00:30:47.225 know is the structural differences
NOTE Confidence: 0.9760291
00:30:47.525 --> 00:30:49.865 and the, bold response differences
NOTE Confidence: 0.9760291
00:30:50.005 --> 00:30:51.770 and and also this more
NOTE Confidence: 0.9760291
00:30:51.770 --> 00:30:53.470 complex sustained attention
NOTE Confidence: 0.9605715
00:30:54.170 --> 00:30:55.390 and some of the inhibitory
NOTE Confidence: 0.9605715
00:30:55.450 --> 00:30:57.370 control deficits that we still
NOTE Confidence: 0.9605715
00:30:57.370 --> 00:30:58.350 see despite
NOTE Confidence: 0.99589413
00:30:58.650 --> 00:30:59.850 three to four weeks of
NOTE Confidence: 0.99589413
00:30:59.850 --> 00:31:00.350 abstinence
NOTE Confidence: 0.8396698
00:31:00.809 --> 00:31:02.190 if they fully recover,
NOTE Confidence: 0.9822764

00:31:02.650 --> 00:31:03.450 you know, if we just
NOTE Confidence: 0.9822764

00:31:03.450 --> 00:31:05.355 follow them for another month
NOTE Confidence: 0.9822764

00:31:05.355 --> 00:31:06.655 or another two months.
NOTE Confidence: 0.995377

00:31:07.435 --> 00:31:08.975 I I hope so.
NOTE Confidence: 0.9557569

00:31:09.915 --> 00:31:10.795 And, you know, in in
NOTE Confidence: 0.9557569

00:31:10.795 --> 00:31:11.695 in the clinic,
NOTE Confidence: 0.97840214

00:31:12.795 --> 00:31:14.155 part of the challenge is
NOTE Confidence: 0.97840214

00:31:14.155 --> 00:31:15.855 even getting people to wanna
NOTE Confidence: 0.97840214

00:31:15.995 --> 00:31:17.195 abstain for that long. You
NOTE Confidence: 0.97840214

00:31:17.195 --> 00:31:17.995 know? So I think there's
NOTE Confidence: 0.97840214

00:31:17.995 --> 00:31:19.180 always a cohort that we're
NOTE Confidence: 0.97840214

00:31:19.180 --> 00:31:20.300 concerned about that we can't
NOTE Confidence: 0.97840214

00:31:20.300 --> 00:31:21.580 get abstinent for even a
NOTE Confidence: 0.97840214

00:31:21.580 --> 00:31:22.240 few days.
NOTE Confidence: 0.97928005

00:31:23.100 --> 00:31:24.540 But, certainly, when I'm talking
NOTE Confidence: 0.97928005

00:31:24.540 --> 00:31:25.440 to the larger

NOTE Confidence: 0.9517893

00:31:25.900 --> 00:31:27.580 group of users and and

NOTE Confidence: 0.9517893

00:31:27.580 --> 00:31:29.360 especially teenagers and parents,

NOTE Confidence: 0.9699357

00:31:29.820 --> 00:31:30.940 I wanna give them that

NOTE Confidence: 0.9699357

00:31:30.940 --> 00:31:33.135 hope that sustained abstinence, there

NOTE Confidence: 0.9699357

00:31:33.215 --> 00:31:34.915 should be some recovery, especially

NOTE Confidence: 0.9904119

00:31:36.095 --> 00:31:37.855 if the abstinence is occurring

NOTE Confidence: 0.9904119

00:31:37.855 --> 00:31:39.155 during the teenage years.

NOTE Confidence: 0.8732056

00:31:40.415 --> 00:31:42.335 I think another question though

NOTE Confidence: 0.8732056

00:31:42.335 --> 00:31:42.835 is,

NOTE Confidence: 0.99936926

00:31:44.415 --> 00:31:45.615 do people get back on

NOTE Confidence: 0.99936926

00:31:45.615 --> 00:31:46.275 the trajectory

NOTE Confidence: 0.9909948

00:31:46.735 --> 00:31:47.855 that they would have been

NOTE Confidence: 0.9909948

00:31:47.855 --> 00:31:49.960 on if they really disrupt,

NOTE Confidence: 0.97875863

00:31:50.340 --> 00:31:51.460 you know, the the full

NOTE Confidence: 0.97875863

00:31:51.460 --> 00:31:52.920 kind of adult like, multiple

NOTE Confidence: 0.97875863

00:31:52.980 --> 00:31:54.920 years of that adolescent development?

NOTE Confidence: 0.9226516

00:31:55.700 --> 00:31:56.820 But that's a that's a

NOTE Confidence: 0.9226516

00:31:56.820 --> 00:31:58.100 really tricky question. I know

NOTE Confidence: 0.9226516

00:31:58.100 --> 00:31:59.620 that Madeline Maya had done

NOTE Confidence: 0.9226516

00:31:59.620 --> 00:32:01.320 that work in Dunedin. And

NOTE Confidence: 0.92566174

00:32:01.860 --> 00:32:03.160 if you if you

NOTE Confidence: 0.99140257

00:32:04.345 --> 00:32:05.544 if you believe her,

NOTE Confidence: 0.99336785

00:32:05.945 --> 00:32:07.304 her results, it seems like

NOTE Confidence: 0.99336785

00:32:07.304 --> 00:32:09.164 people don't recover despite

NOTE Confidence: 0.9969402

00:32:09.705 --> 00:32:10.205 quitting.

NOTE Confidence: 0.99670565

00:32:10.745 --> 00:32:11.865 Yeah. And that's really the

NOTE Confidence: 0.99670565

00:32:11.865 --> 00:32:13.065 only data point we have,

NOTE Confidence: 0.99670565

00:32:13.065 --> 00:32:14.345 and it's a super small

NOTE Confidence: 0.99670565

00:32:14.345 --> 00:32:14.845 sample.

NOTE Confidence: 0.97692645

00:32:16.280 --> 00:32:17.080 You know, at the end

NOTE Confidence: 0.97692645

00:32:17.080 --> 00:32:18.120 of the day, it started

NOTE Confidence: 0.97692645
00:32:18.120 --> 00:32:19.400 as a large sample, but,
NOTE Confidence: 0.97692645
00:32:19.720 --> 00:32:21.480 the the final sample of
NOTE Confidence: 0.97692645
00:32:21.480 --> 00:32:23.100 kind of comparing early adolescent
NOTE Confidence: 0.97692645
00:32:23.159 --> 00:32:25.000 onset to later onset, it's
NOTE Confidence: 0.97692645
00:32:25.000 --> 00:32:26.860 a relatively small one. So
NOTE Confidence: 0.97692645
00:32:27.080 --> 00:32:28.120 one of to me, one
NOTE Confidence: 0.97692645
00:32:28.120 --> 00:32:29.159 of the big questions with
NOTE Confidence: 0.97692645
00:32:29.159 --> 00:32:30.919 a the ABCD data will
NOTE Confidence: 0.97692645
00:32:30.919 --> 00:32:32.684 be, you know, following people's
NOTE Confidence: 0.97692645
00:32:32.684 --> 00:32:33.184 trajectory.
NOTE Confidence: 0.9888455
00:32:34.045 --> 00:32:35.825 And because we have multiple
NOTE Confidence: 0.9888455
00:32:35.965 --> 00:32:38.125 phenotype sessions before the onset
NOTE Confidence: 0.9888455
00:32:38.125 --> 00:32:39.825 of cannabis use at all
NOTE Confidence: 0.9888455
00:32:39.885 --> 00:32:41.345 or other substance use,
NOTE Confidence: 0.9721276
00:32:42.205 --> 00:32:43.645 and we can match them
NOTE Confidence: 0.9721276

00:32:43.645 --> 00:32:44.765 with people even in a
NOTE Confidence: 0.9721276

00:32:44.765 --> 00:32:46.684 twin controlled design or sibling
NOTE Confidence: 0.9721276

00:32:46.684 --> 00:32:47.184 controlled.
NOTE Confidence: 0.9943178

00:32:47.560 --> 00:32:48.680 We can match them to
NOTE Confidence: 0.9943178

00:32:48.680 --> 00:32:49.900 see, you know, did they
NOTE Confidence: 0.9658361

00:32:50.360 --> 00:32:51.560 if they stopped using, do
NOTE Confidence: 0.9658361

00:32:51.560 --> 00:32:52.520 they get back to the
NOTE Confidence: 0.9658361

00:32:52.520 --> 00:32:54.140 trajectory we would have predicted,
NOTE Confidence: 0.9658361

00:32:54.280 --> 00:32:55.900 or are they kinda diminished
NOTE Confidence: 0.9658361

00:32:55.960 --> 00:32:56.620 in adulthood
NOTE Confidence: 0.8900892

00:32:57.000 --> 00:32:59.580 even despite recent abstinence abstinence?
NOTE Confidence: 0.9681051

00:33:00.895 --> 00:33:01.635 Great. Thanks.
NOTE Confidence: 0.960192

00:33:02.095 --> 00:33:03.695 Yeah. Any other questions from
NOTE Confidence: 0.960192

00:33:03.695 --> 00:33:04.515 anyone else?
NOTE Confidence: 0.9237264

00:33:06.815 --> 00:33:08.095 Now is it you can
NOTE Confidence: 0.9237264

00:33:08.095 --> 00:33:09.135 ask now, or you can

NOTE Confidence: 0.9237264

00:33:09.135 --> 00:33:10.275 wait till the end.

NOTE Confidence: 0.9699743

00:33:13.730 --> 00:33:14.770 Alright. I'll throw it a

NOTE Confidence: 0.9699743

00:33:14.770 --> 00:33:15.570 little bit more, and then

NOTE Confidence: 0.9699743

00:33:15.570 --> 00:33:16.310 we can

NOTE Confidence: 0.98503405

00:33:17.490 --> 00:33:19.250 check-in. So maybe you can,

NOTE Confidence: 0.98503405

00:33:19.570 --> 00:33:20.850 you can continue, and then

NOTE Confidence: 0.98503405

00:33:20.850 --> 00:33:22.210 we can give people time

NOTE Confidence: 0.98503405

00:33:22.210 --> 00:33:23.330 at the end to ask

NOTE Confidence: 0.98503405

00:33:23.330 --> 00:33:25.010 more questions. Thank you. Sounds

NOTE Confidence: 0.98503405

00:33:25.010 --> 00:33:25.510 good.

NOTE Confidence: 0.99837935

00:33:28.245 --> 00:33:30.265 Can you see again? Yes.

NOTE Confidence: 0.99837935

00:33:30.405 --> 00:33:31.305 Okay. Good.

NOTE Confidence: 0.94510466

00:33:31.925 --> 00:33:33.285 Okay. So one of the

NOTE Confidence: 0.94510466

00:33:33.285 --> 00:33:34.985 areas that I was interested

NOTE Confidence: 0.94510466

00:33:35.045 --> 00:33:36.245 in that I wanted to

NOTE Confidence: 0.94510466

00:33:36.245 --> 00:33:37.445 share at least a a
NOTE Confidence: 0.94510466

00:33:37.445 --> 00:33:38.645 little bit of the, the
NOTE Confidence: 0.94510466

00:33:38.645 --> 00:33:39.785 results with you
NOTE Confidence: 0.89325756

00:33:40.165 --> 00:33:40.485 is,
NOTE Confidence: 0.99949217

00:33:41.700 --> 00:33:42.899 there there's a lot of
NOTE Confidence: 0.99949217

00:33:42.899 --> 00:33:43.960 individual differences
NOTE Confidence: 0.92742497

00:33:44.260 --> 00:33:45.399 in cannabis effects,
NOTE Confidence: 0.98908764

00:33:45.700 --> 00:33:46.820 and we know that with
NOTE Confidence: 0.98908764

00:33:46.820 --> 00:33:47.700 alcohol and a lot of
NOTE Confidence: 0.98908764

00:33:47.700 --> 00:33:48.820 other things too. You know,
NOTE Confidence: 0.98908764

00:33:48.820 --> 00:33:49.799 there's some folks,
NOTE Confidence: 0.97157216

00:33:50.659 --> 00:33:51.539 like you were saying in
NOTE Confidence: 0.97157216

00:33:51.539 --> 00:33:52.820 the clinic or or that
NOTE Confidence: 0.97157216

00:33:52.820 --> 00:33:54.360 you see that that recover
NOTE Confidence: 0.97157216

00:33:54.580 --> 00:33:55.620 a great deal and there's
NOTE Confidence: 0.97157216

00:33:55.620 --> 00:33:57.145 others that don't. We don't

NOTE Confidence: 0.97157216

00:33:57.145 --> 00:33:58.665 really understand, you know, all

NOTE Confidence: 0.97157216

00:33:58.665 --> 00:34:00.265 the moderators of the drug

NOTE Confidence: 0.97157216

00:34:00.265 --> 00:34:00.765 effects.

NOTE Confidence: 0.9993785

00:34:01.145 --> 00:34:02.025 One thing that I got

NOTE Confidence: 0.9993785

00:34:02.025 --> 00:34:04.365 interested in was aerobic exercise.

NOTE Confidence: 0.98973835

00:34:05.305 --> 00:34:06.425 The main reason is that

NOTE Confidence: 0.98973835

00:34:06.425 --> 00:34:08.364 it does acutely release endocannabinoids.

NOTE Confidence: 0.9738744

00:34:08.985 --> 00:34:10.600 So if it was kind

NOTE Confidence: 0.9738744

00:34:10.600 --> 00:34:12.280 of bolstering that system, that

NOTE Confidence: 0.9738744

00:34:12.280 --> 00:34:13.900 might be a nice mechanism

NOTE Confidence: 0.9738744

00:34:14.040 --> 00:34:15.480 through which we could mitigate

NOTE Confidence: 0.9738744

00:34:15.480 --> 00:34:16.840 some of the cannabis negative

NOTE Confidence: 0.9738744

00:34:16.840 --> 00:34:17.340 effects.

NOTE Confidence: 0.99624074

00:34:18.520 --> 00:34:20.140 But it also releases vascular

NOTE Confidence: 0.99624074

00:34:20.200 --> 00:34:21.640 growth factors and brain derived

NOTE Confidence: 0.99624074

00:34:21.640 --> 00:34:23.320 neurotrophic factor, which are also
NOTE Confidence: 0.99624074

00:34:23.320 --> 00:34:24.300 good for the brain.
NOTE Confidence: 0.9463337

00:34:24.965 --> 00:34:26.905 There's a good large literature
NOTE Confidence: 0.9463337

00:34:26.965 --> 00:34:27.465 linking
NOTE Confidence: 0.9771576

00:34:27.925 --> 00:34:30.325 increased aerobic fitness with better
NOTE Confidence: 0.9771576

00:34:30.325 --> 00:34:32.325 cognitive functioning, especially in verbal
NOTE Confidence: 0.9771576

00:34:32.325 --> 00:34:34.645 memory and executive functioning in
NOTE Confidence: 0.9771576

00:34:34.645 --> 00:34:36.245 middle and older adults because
NOTE Confidence: 0.9771576

00:34:36.245 --> 00:34:37.285 it's been used in the
NOTE Confidence: 0.9771576

00:34:37.285 --> 00:34:38.680 aging literature for quite a
NOTE Confidence: 0.9771576

00:34:38.680 --> 00:34:39.180 while,
NOTE Confidence: 0.997977

00:34:39.480 --> 00:34:40.600 less has been known in
NOTE Confidence: 0.997977

00:34:40.600 --> 00:34:42.060 teenagers and young adults.
NOTE Confidence: 0.998037

00:34:45.160 --> 00:34:46.680 First off, we looked at
NOTE Confidence: 0.998037

00:34:46.680 --> 00:34:48.300 some behavioral markers.
NOTE Confidence: 0.9966315

00:34:49.480 --> 00:34:51.180 Aerobic fitness has been

NOTE Confidence: 0.9734425

00:34:51.555 --> 00:34:52.994 validated in the treatment of

NOTE Confidence: 0.9734425

00:34:52.994 --> 00:34:54.194 depression. So we wanted to

NOTE Confidence: 0.9734425

00:34:54.194 --> 00:34:55.795 look at depressive symptoms as

NOTE Confidence: 0.9734425

00:34:55.795 --> 00:34:57.875 well as self reported symptoms

NOTE Confidence: 0.9734425

00:34:57.875 --> 00:34:59.094 of things like disinhibition

NOTE Confidence: 0.999274

00:34:59.555 --> 00:35:00.855 and emotion processing.

NOTE Confidence: 0.9863932

00:35:02.114 --> 00:35:03.315 First off, we did see

NOTE Confidence: 0.9863932

00:35:03.315 --> 00:35:05.130 that increased cannabis use,

NOTE Confidence: 0.9915226

00:35:05.769 --> 00:35:08.029 was related to increased depressive

NOTE Confidence: 0.9915226

00:35:08.089 --> 00:35:10.589 symptoms, increased self reported disinhibition

NOTE Confidence: 0.99864405

00:35:11.049 --> 00:35:11.549 problems

NOTE Confidence: 0.9185783

00:35:11.930 --> 00:35:13.289 kind of in people's everyday

NOTE Confidence: 0.9185783

00:35:13.289 --> 00:35:13.789 life,

NOTE Confidence: 0.99497247

00:35:14.089 --> 00:35:15.789 as well as increased response

NOTE Confidence: 0.99497247

00:35:15.849 --> 00:35:17.950 time on an emotion recognition

NOTE Confidence: 0.99497247

00:35:18.170 --> 00:35:18.670 task.
NOTE Confidence: 0.9796108

00:35:19.565 --> 00:35:21.165 This is controlling for comorbid
NOTE Confidence: 0.9796108

00:35:21.165 --> 00:35:23.105 alcohol, nicotine use, and demographics
NOTE Confidence: 0.9796108

00:35:23.325 --> 00:35:24.225 that might be linked.
NOTE Confidence: 0.97880757

00:35:25.245 --> 00:35:26.925 Surprisingly, we didn't see results
NOTE Confidence: 0.97880757

00:35:26.925 --> 00:35:29.185 with aerobic fitness either independently
NOTE Confidence: 0.97880757

00:35:29.325 --> 00:35:30.945 or interacting with cannabis
NOTE Confidence: 0.92496395

00:35:31.405 --> 00:35:32.545 with these outcomes.
NOTE Confidence: 0.9805185

00:35:33.260 --> 00:35:34.880 That might be because we
NOTE Confidence: 0.9805185

00:35:35.020 --> 00:35:37.440 excluded for major psychiatric comorbidities.
NOTE Confidence: 0.9967996

00:35:37.739 --> 00:35:39.660 So I wouldn't generalize this
NOTE Confidence: 0.9967996

00:35:39.660 --> 00:35:40.559 to a more,
NOTE Confidence: 0.99975556

00:35:41.099 --> 00:35:41.599 clinically
NOTE Confidence: 0.99893856

00:35:41.980 --> 00:35:43.440 relevant or salient
NOTE Confidence: 0.9609119

00:35:45.099 --> 00:35:46.619 population. I'd I'd like to
NOTE Confidence: 0.9609119

00:35:46.619 --> 00:35:47.119 see,

NOTE Confidence: 0.98088163
00:35:47.525 --> 00:35:49.285 you know, people with more
NOTE Confidence: 0.98088163
00:35:49.285 --> 00:35:49.785 comorbid,
NOTE Confidence: 0.93263686
00:35:50.245 --> 00:35:51.385 affective, or,
NOTE Confidence: 0.99877656
00:35:52.085 --> 00:35:52.585 externalizing
NOTE Confidence: 0.8183909
00:35:52.965 --> 00:35:53.465 disorders,
NOTE Confidence: 0.929807
00:35:54.085 --> 00:35:55.705 what the relationship would be.
NOTE Confidence: 0.98116404
00:35:56.645 --> 00:35:58.005 Again, we saw that increased
NOTE Confidence: 0.98116404
00:35:58.005 --> 00:35:59.844 cannabis use was related to
NOTE Confidence: 0.98116404
00:35:59.844 --> 00:36:00.985 poor working memory,
NOTE Confidence: 0.9254894
00:36:01.700 --> 00:36:02.600 sequencing, and psychomotor
NOTE Confidence: 0.9863294
00:36:02.900 --> 00:36:04.420 speed after those three weeks
NOTE Confidence: 0.9863294
00:36:04.420 --> 00:36:06.500 of abstinence and controlling for
NOTE Confidence: 0.9863294
00:36:06.500 --> 00:36:07.400 aerobic fitness.
NOTE Confidence: 0.957114
00:36:07.860 --> 00:36:09.380 And aerobic fitness on its
NOTE Confidence: 0.957114
00:36:09.380 --> 00:36:10.820 own are was linked with
NOTE Confidence: 0.957114

00:36:10.820 --> 00:36:11.320 increased
NOTE Confidence: 0.9719515

00:36:11.700 --> 00:36:13.940 visual memory, verbal fluency, and
NOTE Confidence: 0.9719515

00:36:13.940 --> 00:36:15.855 sequencing ability. And I wanna
NOTE Confidence: 0.9719515

00:36:15.855 --> 00:36:17.135 note that the effect sizes
NOTE Confidence: 0.9719515

00:36:17.135 --> 00:36:18.575 were large for this. So
NOTE Confidence: 0.9719515

00:36:18.575 --> 00:36:19.775 this was a a nice
NOTE Confidence: 0.9719515

00:36:19.775 --> 00:36:21.695 robust effect of aerobic fitness
NOTE Confidence: 0.9719515

00:36:21.695 --> 00:36:22.515 for cognition
NOTE Confidence: 0.9866581

00:36:22.975 --> 00:36:24.114 in a very healthy,
NOTE Confidence: 0.99974877

00:36:25.375 --> 00:36:25.875 young
NOTE Confidence: 0.9949573

00:36:26.175 --> 00:36:28.114 group without metabolic conditions.
NOTE Confidence: 0.9671506

00:36:29.469 --> 00:36:30.510 And we also saw an
NOTE Confidence: 0.9671506

00:36:30.510 --> 00:36:32.350 interaction between aerobic fitness and
NOTE Confidence: 0.9671506

00:36:32.350 --> 00:36:33.890 cannabis use in predicting
NOTE Confidence: 0.9793114

00:36:34.270 --> 00:36:37.170 inhibitory control and psychomotor speed.
NOTE Confidence: 0.9793114

00:36:37.469 --> 00:36:38.989 In that, the cannabis users

NOTE Confidence: 0.9793114

00:36:38.989 --> 00:36:40.690 that were more highly fit

NOTE Confidence: 0.9793114

00:36:40.910 --> 00:36:42.530 did better on these cognitive

NOTE Confidence: 0.9793114

00:36:42.670 --> 00:36:43.964 tasks compared to the low

NOTE Confidence: 0.9793114

00:36:43.964 --> 00:36:45.344 fit cannabis users.

NOTE Confidence: 0.9993071

00:36:45.805 --> 00:36:47.005 So that is some nice

NOTE Confidence: 0.9993071

00:36:47.005 --> 00:36:48.384 evidence that it might,

NOTE Confidence: 0.9744589

00:36:49.005 --> 00:36:50.204 be something that of of

NOTE Confidence: 0.9744589

00:36:50.204 --> 00:36:51.484 a resilience marker at the

NOTE Confidence: 0.9744589

00:36:51.484 --> 00:36:52.525 very least and something that

NOTE Confidence: 0.9744589

00:36:52.525 --> 00:36:53.964 we could perhaps harness as

NOTE Confidence: 0.9744589

00:36:53.964 --> 00:36:54.625 an intervention.

NOTE Confidence: 0.999751

00:36:57.359 --> 00:36:58.500 This is a little

NOTE Confidence: 0.95111394

00:36:59.280 --> 00:36:59.780 tricky,

NOTE Confidence: 0.99551916

00:37:00.239 --> 00:37:01.520 but we looked at,

NOTE Confidence: 0.940085

00:37:01.920 --> 00:37:03.380 whole kinda whole brain

NOTE Confidence: 0.9885964

00:37:03.680 --> 00:37:05.920 structural MRI. In this case,
NOTE Confidence: 0.9885964

00:37:05.920 --> 00:37:06.579 it was,
NOTE Confidence: 0.8186474

00:37:07.200 --> 00:37:07.700 volumes,
NOTE Confidence: 0.9996567

00:37:08.525 --> 00:37:09.265 And there's
NOTE Confidence: 0.9827888

00:37:09.645 --> 00:37:11.565 two interactions going on here.
NOTE Confidence: 0.9827888

00:37:11.565 --> 00:37:13.005 First off, there's an interaction
NOTE Confidence: 0.9827888

00:37:13.005 --> 00:37:15.085 between cannabis and sex and
NOTE Confidence: 0.9827888

00:37:15.085 --> 00:37:15.585 volume
NOTE Confidence: 0.97714734

00:37:16.205 --> 00:37:17.885 that I commonly see if
NOTE Confidence: 0.97714734

00:37:17.885 --> 00:37:18.925 you kind of do this
NOTE Confidence: 0.97714734

00:37:18.925 --> 00:37:21.405 cross sectional sample of, an
NOTE Confidence: 0.97714734

00:37:21.405 --> 00:37:22.445 age range where there's a
NOTE Confidence: 0.97714734

00:37:22.445 --> 00:37:24.145 lot of pruning going on,
NOTE Confidence: 0.97714734

00:37:24.290 --> 00:37:25.109 and girls
NOTE Confidence: 0.9962472

00:37:25.969 --> 00:37:27.330 are about two years earlier
NOTE Confidence: 0.9962472

00:37:27.330 --> 00:37:29.109 in their pruning versus boys.

NOTE Confidence: 0.98387754

00:37:31.089 --> 00:37:33.089 But the cannabis using males

NOTE Confidence: 0.98387754

00:37:33.089 --> 00:37:35.170 had smaller regions in these

NOTE Confidence: 0.98387754

00:37:35.170 --> 00:37:36.770 areas, whereas the females actually

NOTE Confidence: 0.98387754

00:37:36.770 --> 00:37:37.510 had larger

NOTE Confidence: 0.984169

00:37:38.925 --> 00:37:40.445 volumes compared to their same

NOTE Confidence: 0.984169

00:37:40.445 --> 00:37:41.265 sex controls.

NOTE Confidence: 0.8821189

00:37:41.725 --> 00:37:43.425 And the regions were primarily

NOTE Confidence: 0.8821189

00:37:43.565 --> 00:37:45.265 in the frontal lobe, so

NOTE Confidence: 0.8821189

00:37:45.325 --> 00:37:47.825 left lateral frontal area, caudal

NOTE Confidence: 0.8821189

00:37:47.885 --> 00:37:48.705 middle frontal,

NOTE Confidence: 0.97847605

00:37:49.085 --> 00:37:50.545 frontal, and then right

NOTE Confidence: 0.92005587

00:37:51.030 --> 00:37:52.469 superior frontal and,

NOTE Confidence: 0.98006594

00:37:53.030 --> 00:37:54.070 as well as some kind

NOTE Confidence: 0.98006594

00:37:54.070 --> 00:37:56.010 of temporal and parietal regions.

NOTE Confidence: 0.98129404

00:37:57.350 --> 00:37:59.510 This increased or decreased volumes

NOTE Confidence: 0.98129404

00:37:59.510 --> 00:38:00.489 was not advantageous
NOTE Confidence: 0.9640497

00:38:00.790 --> 00:38:02.310 for either group, so both
NOTE Confidence: 0.9640497

00:38:02.310 --> 00:38:03.210 of them were
NOTE Confidence: 0.95613027

00:38:04.215 --> 00:38:05.515 linked with poor cognition.
NOTE Confidence: 0.99606967

00:38:06.535 --> 00:38:07.035 Notably,
NOTE Confidence: 0.9505434

00:38:07.895 --> 00:38:09.895 improved aerobic fitness was related
NOTE Confidence: 0.9505434

00:38:09.895 --> 00:38:11.815 to larger volumes in frontal
NOTE Confidence: 0.9505434

00:38:11.815 --> 00:38:12.955 parietal cerebellar
NOTE Confidence: 0.9306102

00:38:13.255 --> 00:38:14.795 as well as caudate regions.
NOTE Confidence: 0.99258953

00:38:15.735 --> 00:38:17.035 And there was an interaction
NOTE Confidence: 0.99258953

00:38:17.175 --> 00:38:18.935 with cannabis and aerobic fitness
NOTE Confidence: 0.99258953

00:38:18.935 --> 00:38:20.580 in the left superior temporal
NOTE Confidence: 0.99258953

00:38:20.580 --> 00:38:21.080 region
NOTE Confidence: 0.9640826

00:38:21.380 --> 00:38:22.820 and that the cannabis users
NOTE Confidence: 0.9640826

00:38:22.820 --> 00:38:24.440 actually had a less robust
NOTE Confidence: 0.9640826

00:38:24.660 --> 00:38:26.980 relationship between their aerobic fitness

NOTE Confidence: 0.9640826

00:38:26.980 --> 00:38:28.440 and volume in this region,

NOTE Confidence: 0.9893117

00:38:28.820 --> 00:38:30.740 maybe showing, like, less of

NOTE Confidence: 0.9893117

00:38:30.740 --> 00:38:32.260 a benefit of the aerobic

NOTE Confidence: 0.9893117

00:38:32.260 --> 00:38:33.860 fitness. Maybe the cannabis use

NOTE Confidence: 0.9893117

00:38:33.860 --> 00:38:34.305 is kinda

NOTE Confidence: 0.99817556

00:38:35.184 --> 00:38:36.385 disrupting some of the positive

NOTE Confidence: 0.99817556

00:38:36.385 --> 00:38:37.984 effects of aerobic fitness there

NOTE Confidence: 0.99817556

00:38:37.984 --> 00:38:38.805 in that case.

NOTE Confidence: 0.87637967

00:38:39.184 --> 00:38:40.005 But, overall,

NOTE Confidence: 0.9911872

00:38:40.785 --> 00:38:42.305 our conclusion from this is

NOTE Confidence: 0.9911872

00:38:42.305 --> 00:38:43.585 that at least in healthy

NOTE Confidence: 0.9911872

00:38:43.585 --> 00:38:45.585 people without metabolic conditions, it

NOTE Confidence: 0.9911872

00:38:45.585 --> 00:38:47.364 does look like aerobic fitness

NOTE Confidence: 0.9930327

00:38:48.060 --> 00:38:49.100 has links with,

NOTE Confidence: 0.9518777

00:38:49.660 --> 00:38:51.660 positive brain outcomes, both in

NOTE Confidence: 0.9518777

00:38:51.660 --> 00:38:53.360 cognition and brain structure,
NOTE Confidence: 0.99805623

00:38:53.739 --> 00:38:54.780 and might be a good
NOTE Confidence: 0.99805623

00:38:54.780 --> 00:38:56.780 thing to pursue for supporting
NOTE Confidence: 0.99805623

00:38:56.780 --> 00:38:57.280 neurocognition
NOTE Confidence: 0.9924608

00:38:57.660 --> 00:38:59.360 in regular cannabis users.
NOTE Confidence: 0.89405406

00:39:00.714 --> 00:39:01.835 And I'll also note, a
NOTE Confidence: 0.89405406

00:39:01.835 --> 00:39:02.955 lot of people ask, well,
NOTE Confidence: 0.89405406

00:39:02.955 --> 00:39:04.395 why would it only be
NOTE Confidence: 0.89405406

00:39:04.395 --> 00:39:05.835 effective for cannabis? Not all
NOTE Confidence: 0.89405406

00:39:05.835 --> 00:39:07.515 call it. No. I suspect
NOTE Confidence: 0.89405406

00:39:07.515 --> 00:39:08.815 it'd be, beneficial
NOTE Confidence: 0.9998586

00:39:09.114 --> 00:39:09.614 for
NOTE Confidence: 0.9654117

00:39:09.915 --> 00:39:11.515 pretty much anyone. You know,
NOTE Confidence: 0.9654117

00:39:11.515 --> 00:39:12.315 it might be kind of
NOTE Confidence: 0.9654117

00:39:12.315 --> 00:39:12.974 a cheap,
NOTE Confidence: 0.9995858

00:39:13.700 --> 00:39:15.640 way to boost brain function.

NOTE Confidence: 0.99882686

00:39:16.099 --> 00:39:16.599 Okay.

NOTE Confidence: 0.9014023

00:39:17.700 --> 00:39:18.599 So, overall,

NOTE Confidence: 0.9911633

00:39:19.779 --> 00:39:22.420 the recent recent cannabis use

NOTE Confidence: 0.9911633

00:39:22.420 --> 00:39:24.259 exposure during adolescence and into

NOTE Confidence: 0.9911633

00:39:24.259 --> 00:39:25.779 young adulthood has been linked

NOTE Confidence: 0.9911633

00:39:25.779 --> 00:39:27.719 in modest differences in cognitive

NOTE Confidence: 0.9911633

00:39:27.779 --> 00:39:29.525 function, brain structure, as

NOTE Confidence: 0.99361545

00:39:30.145 --> 00:39:31.585 well as bold response to

NOTE Confidence: 0.99361545

00:39:31.585 --> 00:39:32.244 emotional stimuli

NOTE Confidence: 0.95411485

00:39:33.505 --> 00:39:35.125 as well as inhibitory control

NOTE Confidence: 0.95411485

00:39:35.424 --> 00:39:36.484 and at rest.

NOTE Confidence: 0.9856165

00:39:37.585 --> 00:39:38.464 We see a lot of

NOTE Confidence: 0.9856165

00:39:38.464 --> 00:39:39.924 dose dependent relationships.

NOTE Confidence: 0.98807746

00:39:40.719 --> 00:39:42.640 Adolescence and early onset of

NOTE Confidence: 0.98807746

00:39:42.640 --> 00:39:45.060 use, is a vulnerability marker,

NOTE Confidence: 0.98807746

00:39:45.200 --> 00:39:46.640 and sex might moderate a
NOTE Confidence: 0.98807746

00:39:46.640 --> 00:39:47.620 lot of these effects.
NOTE Confidence: 0.9986812

00:39:48.239 --> 00:39:49.920 Across all my studies, what
NOTE Confidence: 0.9986812

00:39:49.920 --> 00:39:50.580 the pattern
NOTE Confidence: 0.96053576

00:39:50.960 --> 00:39:52.239 kind of emerges is that
NOTE Confidence: 0.96053576

00:39:52.239 --> 00:39:53.755 males might have greater effects
NOTE Confidence: 0.96053576

00:39:53.755 --> 00:39:55.215 and kind of cold cognition,
NOTE Confidence: 0.9969379

00:39:55.835 --> 00:39:56.815 whereas females
NOTE Confidence: 0.99782753

00:39:57.114 --> 00:39:58.155 seem to show more of
NOTE Confidence: 0.99782753

00:39:58.155 --> 00:39:58.895 this vulnerability
NOTE Confidence: 0.98795015

00:39:59.515 --> 00:40:01.775 towards things like depressive symptoms,
NOTE Confidence: 0.94973534

00:40:03.355 --> 00:40:05.835 lower affective state, or emotion
NOTE Confidence: 0.94973534

00:40:05.835 --> 00:40:06.335 regulation.
NOTE Confidence: 0.9950879

00:40:07.920 --> 00:40:09.200 The study effect sizes are
NOTE Confidence: 0.9950879

00:40:09.200 --> 00:40:10.739 generally small to medium.
NOTE Confidence: 0.948008

00:40:11.280 --> 00:40:12.319 When you look at meta

NOTE Confidence: 0.948008

00:40:12.319 --> 00:40:14.319 analyses that really combine studies,

NOTE Confidence: 0.948008

00:40:14.319 --> 00:40:15.839 the the effect sizes are

NOTE Confidence: 0.948008

00:40:15.839 --> 00:40:17.200 generally small, and some of

NOTE Confidence: 0.948008

00:40:17.200 --> 00:40:18.099 them are null.

NOTE Confidence: 0.99478596

00:40:18.560 --> 00:40:19.520 So, you know, that might

NOTE Confidence: 0.99478596

00:40:19.520 --> 00:40:20.500 be to the heterogeneity

NOTE Confidence: 0.87857765

00:40:21.040 --> 00:40:22.125 of of the samples,

NOTE Confidence: 0.9972488

00:40:22.425 --> 00:40:23.785 or it might be that

NOTE Confidence: 0.9972488

00:40:23.785 --> 00:40:24.905 that's what the real effect

NOTE Confidence: 0.9972488

00:40:24.905 --> 00:40:25.405 is.

NOTE Confidence: 0.98068297

00:40:25.864 --> 00:40:27.705 Aerobic exercise might produce some

NOTE Confidence: 0.98068297

00:40:27.705 --> 00:40:29.485 resilience to the cannabis effects,

NOTE Confidence: 0.90002894

00:40:29.864 --> 00:40:31.465 and there is, like, like,

NOTE Confidence: 0.90002894

00:40:31.465 --> 00:40:32.425 we were talking at the

NOTE Confidence: 0.90002894

00:40:32.425 --> 00:40:33.864 start, hopeful evidence of some

NOTE Confidence: 0.90002894

00:40:33.864 --> 00:40:34.364 neurocognitive
NOTE Confidence: 0.99946547

00:40:34.745 --> 00:40:36.125 recovery with abstinence.
NOTE Confidence: 0.9471981

00:40:37.020 --> 00:40:38.060 I've seen it in my
NOTE Confidence: 0.9471981

00:40:38.060 --> 00:40:39.980 own kind of longitudinal mini
NOTE Confidence: 0.9471981

00:40:39.980 --> 00:40:41.120 neuropsych battery,
NOTE Confidence: 0.9996266

00:40:41.500 --> 00:40:42.780 and some other folks have
NOTE Confidence: 0.9996266

00:40:42.780 --> 00:40:43.680 seen recovery
NOTE Confidence: 0.984107

00:40:43.980 --> 00:40:45.100 as rapid as three to
NOTE Confidence: 0.984107

00:40:45.100 --> 00:40:46.620 fourteen days. But we really
NOTE Confidence: 0.984107

00:40:46.620 --> 00:40:48.400 do need that repeated longitudinal
NOTE Confidence: 0.8717509

00:40:48.780 --> 00:40:49.280 imaging,
NOTE Confidence: 0.953116

00:40:50.380 --> 00:40:51.820 and we also need the
NOTE Confidence: 0.953116

00:40:51.820 --> 00:40:54.515 longer term trajectory analysis over
NOTE Confidence: 0.953116

00:40:54.515 --> 00:40:55.015 development.
NOTE Confidence: 0.9986187

00:40:57.154 --> 00:40:58.194 The other thing is, of
NOTE Confidence: 0.9986187

00:40:58.194 --> 00:40:59.894 course, causality questions.

NOTE Confidence: 0.9618294
00:41:00.275 --> 00:41:01.414 You know, there's been,
NOTE Confidence: 0.9980913
00:41:02.275 --> 00:41:03.315 the bottom line is that
NOTE Confidence: 0.9980913
00:41:03.315 --> 00:41:04.614 there's been some retrospective
NOTE Confidence: 0.9129896
00:41:04.994 --> 00:41:07.075 analysis of larger twin studies
NOTE Confidence: 0.9129896
00:41:07.075 --> 00:41:08.340 where you controlled for twin
NOTE Confidence: 0.9129896
00:41:08.340 --> 00:41:08.840 status.
NOTE Confidence: 0.9563513
00:41:09.460 --> 00:41:10.500 And if you looked at
NOTE Confidence: 0.9563513
00:41:10.500 --> 00:41:12.360 cannabis use, it did longitudinally
NOTE Confidence: 0.96950734
00:41:12.740 --> 00:41:14.340 predict IQ, but then when
NOTE Confidence: 0.96950734
00:41:14.340 --> 00:41:16.020 you controlled for twin status,
NOTE Confidence: 0.96950734
00:41:16.020 --> 00:41:17.380 that went away in some
NOTE Confidence: 0.96950734
00:41:17.380 --> 00:41:18.200 of those studies,
NOTE Confidence: 0.95752144
00:41:18.660 --> 00:41:20.040 suggesting that perhaps
NOTE Confidence: 0.99622095
00:41:20.565 --> 00:41:22.484 there's a shared genetic load
NOTE Confidence: 0.99622095
00:41:22.484 --> 00:41:24.484 or environmental load that's really
NOTE Confidence: 0.99622095

00:41:24.484 --> 00:41:24.984 predicting,
NOTE Confidence: 0.9985012

00:41:25.445 --> 00:41:27.045 you know, the trajectory towards
NOTE Confidence: 0.9985012

00:41:27.045 --> 00:41:28.964 becoming a regular cannabis user.
NOTE Confidence: 0.9985012

00:41:28.964 --> 00:41:29.464 So
NOTE Confidence: 0.98594403

00:41:30.005 --> 00:41:31.605 that's why we really do
NOTE Confidence: 0.98594403

00:41:31.605 --> 00:41:33.890 need the more, national prospective
NOTE Confidence: 0.98594403

00:41:34.030 --> 00:41:34.530 longitudinal
NOTE Confidence: 0.9455948

00:41:34.910 --> 00:41:36.930 studies like the ABCD study.
NOTE Confidence: 0.9861245

00:41:37.469 --> 00:41:38.829 I know Yale is involved
NOTE Confidence: 0.9861245

00:41:38.829 --> 00:41:39.790 with this, so I I
NOTE Confidence: 0.9861245

00:41:39.790 --> 00:41:40.910 won't spend too much time
NOTE Confidence: 0.9861245

00:41:40.910 --> 00:41:42.670 on the methods, but we
NOTE Confidence: 0.9861245

00:41:42.670 --> 00:41:44.910 collected eight over eleven thousand
NOTE Confidence: 0.9861245

00:41:44.910 --> 00:41:46.030 nine and ten year olds
NOTE Confidence: 0.9861245

00:41:46.030 --> 00:41:47.809 across twenty one research sites.
NOTE Confidence: 0.9895122

00:41:48.375 --> 00:41:49.195 Most importantly,

NOTE Confidence: 0.98661184

00:41:50.455 --> 00:41:52.055 at at baseline and at

NOTE Confidence: 0.98661184

00:41:52.055 --> 00:41:53.415 one year, two year, they're

NOTE Confidence: 0.98661184

00:41:53.415 --> 00:41:55.255 very substance naive. So they're

NOTE Confidence: 0.98661184

00:41:55.255 --> 00:41:56.535 very young. They're nine to

NOTE Confidence: 0.98661184

00:41:56.535 --> 00:41:57.594 eleven years old.

NOTE Confidence: 0.96723175

00:41:58.055 --> 00:41:59.415 And, one of my former

NOTE Confidence: 0.96723175

00:41:59.415 --> 00:42:01.175 graduate students here, Tasha Wade,

NOTE Confidence: 0.96723175

00:42:01.175 --> 00:42:02.360 who is an assistant professor

NOTE Confidence: 0.96723175

00:42:02.360 --> 00:42:03.100 at UCSD,

NOTE Confidence: 0.9918544

00:42:04.120 --> 00:42:05.980 did a recent analysis looking

NOTE Confidence: 0.9918544

00:42:06.120 --> 00:42:07.880 at ABCD youth that had

NOTE Confidence: 0.9918544

00:42:07.880 --> 00:42:08.860 hair toxicology.

NOTE Confidence: 0.994128

00:42:10.200 --> 00:42:10.940 And so,

NOTE Confidence: 0.99692726

00:42:11.640 --> 00:42:12.920 about a hundred and twenty

NOTE Confidence: 0.99692726

00:42:12.920 --> 00:42:14.060 three with and without

NOTE Confidence: 0.9764995

00:42:14.600 --> 00:42:16.360 self reported cannabis use, and
NOTE Confidence: 0.9764995

00:42:16.360 --> 00:42:17.585 they were matched on all
NOTE Confidence: 0.9764995

00:42:17.585 --> 00:42:18.404 the demographics.
NOTE Confidence: 0.99216235

00:42:19.105 --> 00:42:21.045 Controlling for baseline cognition,
NOTE Confidence: 0.98279065

00:42:21.744 --> 00:42:23.025 what she found was that
NOTE Confidence: 0.98279065

00:42:23.025 --> 00:42:24.864 the being a cannabis user
NOTE Confidence: 0.98279065

00:42:24.864 --> 00:42:26.065 at all was linked with
NOTE Confidence: 0.98279065

00:42:26.065 --> 00:42:27.364 poor visual memory,
NOTE Confidence: 0.98947215

00:42:27.825 --> 00:42:29.424 and then self reported past
NOTE Confidence: 0.98947215

00:42:29.424 --> 00:42:31.105 year cannabis use was linked
NOTE Confidence: 0.98947215

00:42:31.105 --> 00:42:31.605 with,
NOTE Confidence: 0.99859315

00:42:32.260 --> 00:42:34.020 lower visual memory and working
NOTE Confidence: 0.99859315

00:42:34.020 --> 00:42:34.520 memory.
NOTE Confidence: 0.94741374

00:42:35.140 --> 00:42:36.120 And then interestingly,
NOTE Confidence: 0.9980891

00:42:36.500 --> 00:42:38.520 the hair toxicology analysis
NOTE Confidence: 0.98568696

00:42:39.060 --> 00:42:41.060 of carboxy THC, so the

NOTE Confidence: 0.98568696
00:42:41.060 --> 00:42:43.080 metabolite from using delta nine,
NOTE Confidence: 0.98568696
00:42:43.300 --> 00:42:44.924 was linked with poor nonverbal
NOTE Confidence: 0.98568696
00:42:45.145 --> 00:42:47.625 vocabulary, inhibitory control, and visual
NOTE Confidence: 0.98568696
00:42:47.625 --> 00:42:49.305 memory. So it kinda added
NOTE Confidence: 0.98568696
00:42:49.305 --> 00:42:50.045 the sensitivity
NOTE Confidence: 0.9987633
00:42:50.505 --> 00:42:51.704 to pick up on some
NOTE Confidence: 0.9987633
00:42:51.704 --> 00:42:52.204 relationships.
NOTE Confidence: 0.9860392
00:42:53.224 --> 00:42:54.424 Part of that is most
NOTE Confidence: 0.9860392
00:42:54.424 --> 00:42:55.545 likely that we're getting a
NOTE Confidence: 0.9860392
00:42:55.545 --> 00:42:56.364 little underreporting
NOTE Confidence: 0.98252296
00:42:57.700 --> 00:42:58.820 in the self report in
NOTE Confidence: 0.98252296
00:42:58.820 --> 00:43:01.239 this very young, normative cohort.
NOTE Confidence: 0.9973627
00:43:01.780 --> 00:43:02.980 One thing that's caught my
NOTE Confidence: 0.9973627
00:43:02.980 --> 00:43:04.020 eye that I really wanna
NOTE Confidence: 0.9973627
00:43:04.020 --> 00:43:05.300 be keeping an eye on
NOTE Confidence: 0.9973627

00:43:05.300 --> 00:43:05.960 is that,
NOTE Confidence: 0.9971377

00:43:06.420 --> 00:43:07.719 although it wasn't statistically
NOTE Confidence: 0.99647915

00:43:08.180 --> 00:43:08.680 significant,
NOTE Confidence: 0.9863031

00:43:08.980 --> 00:43:11.055 the extent of CBD level
NOTE Confidence: 0.9863031

00:43:11.055 --> 00:43:11.875 in the hair
NOTE Confidence: 0.99701

00:43:12.175 --> 00:43:14.015 was positively linked with visual
NOTE Confidence: 0.99701

00:43:14.015 --> 00:43:15.555 memory in this case. So
NOTE Confidence: 0.99701

00:43:15.695 --> 00:43:16.815 this might just be a
NOTE Confidence: 0.99701

00:43:16.815 --> 00:43:18.655 slight early sign that that
NOTE Confidence: 0.99701

00:43:18.655 --> 00:43:20.575 CBD use might mitigate some
NOTE Confidence: 0.99701

00:43:20.575 --> 00:43:21.955 of the THC effects.
NOTE Confidence: 0.9377177

00:43:24.680 --> 00:43:25.980 But what about the mechanism?
NOTE Confidence: 0.9377177

00:43:26.200 --> 00:43:27.339 So this is where
NOTE Confidence: 0.98029083

00:43:27.640 --> 00:43:28.599 I'm gonna get in a
NOTE Confidence: 0.98029083

00:43:28.599 --> 00:43:29.719 little bit to the,
NOTE Confidence: 0.972574

00:43:30.599 --> 00:43:31.819 circulating endocannabinoid,

NOTE Confidence: 0.97891587
00:43:32.839 --> 00:43:33.339 research.
NOTE Confidence: 0.99935514
00:43:33.640 --> 00:43:34.680 And for the sake of
NOTE Confidence: 0.99935514
00:43:34.680 --> 00:43:35.180 time,
NOTE Confidence: 0.9994343
00:43:35.480 --> 00:43:36.680 I'm gonna skip over a
NOTE Confidence: 0.9994343
00:43:36.680 --> 00:43:38.059 little bit of the mechanisms
NOTE Confidence: 0.9667224
00:43:38.359 --> 00:43:39.465 here because I I think
NOTE Confidence: 0.9667224
00:43:39.465 --> 00:43:40.745 your group has a good
NOTE Confidence: 0.9667224
00:43:40.745 --> 00:43:41.965 sense of that.
NOTE Confidence: 0.9919791
00:43:42.505 --> 00:43:43.485 But to just,
NOTE Confidence: 0.99842995
00:43:44.105 --> 00:43:45.705 really emphasize that this is
NOTE Confidence: 0.99842995
00:43:45.705 --> 00:43:46.205 peripheral
NOTE Confidence: 0.99028015
00:43:46.505 --> 00:43:48.205 levels of endocannabinoid,
NOTE Confidence: 0.8964286
00:43:49.545 --> 00:43:50.045 concentrations.
NOTE Confidence: 0.99796647
00:43:51.549 --> 00:43:52.910 These have been linked in
NOTE Confidence: 0.99796647
00:43:52.910 --> 00:43:54.589 both animal and adult studies,
NOTE Confidence: 0.99796647

00:43:54.589 --> 00:43:55.710 but there really hasn't been
NOTE Confidence: 0.99796647

00:43:55.710 --> 00:43:57.469 any human teenage work to
NOTE Confidence: 0.99796647

00:43:57.469 --> 00:43:57.969 date.
NOTE Confidence: 0.98721546

00:43:58.349 --> 00:43:59.710 So this is a cohort
NOTE Confidence: 0.98721546

00:43:59.710 --> 00:44:01.469 within the ABCD study that
NOTE Confidence: 0.98721546

00:44:01.469 --> 00:44:03.230 I've been, trying to collect
NOTE Confidence: 0.98721546

00:44:03.230 --> 00:44:04.529 the circulating endocannabinoids
NOTE Confidence: 0.9995624

00:44:04.989 --> 00:44:05.489 from.
NOTE Confidence: 0.9899741

00:44:06.405 --> 00:44:08.005 Importantly, we did measure state
NOTE Confidence: 0.9899741

00:44:08.005 --> 00:44:09.205 based factors that have been
NOTE Confidence: 0.9899741

00:44:09.205 --> 00:44:10.485 linked with endo levels, and
NOTE Confidence: 0.9899741

00:44:10.485 --> 00:44:11.225 we statistically
NOTE Confidence: 0.8417824

00:44:11.605 --> 00:44:12.585 analyzed that.
NOTE Confidence: 0.9521882

00:44:13.605 --> 00:44:14.725 The main thing here that
NOTE Confidence: 0.9521882

00:44:14.725 --> 00:44:16.005 I wanna say is that
NOTE Confidence: 0.9521882

00:44:16.005 --> 00:44:17.685 those circulating endos, and if

NOTE Confidence: 0.9521882
00:44:17.685 --> 00:44:18.725 I focus in on two
NOTE Confidence: 0.9521882
00:44:18.725 --> 00:44:20.505 AG and anandamide here,
NOTE Confidence: 0.9840789
00:44:21.020 --> 00:44:22.219 have were linked,
NOTE Confidence: 0.99992347
00:44:22.619 --> 00:44:23.119 significantly
NOTE Confidence: 0.9908878
00:44:23.420 --> 00:44:25.180 with brain volume in unique
NOTE Confidence: 0.9908878
00:44:25.180 --> 00:44:25.680 ways.
NOTE Confidence: 0.95814234
00:44:26.060 --> 00:44:27.579 So lower levels of two
NOTE Confidence: 0.95814234
00:44:27.579 --> 00:44:29.339 AG were linked with larger
NOTE Confidence: 0.95814234
00:44:29.339 --> 00:44:31.119 volumes in the parisor retalis,
NOTE Confidence: 0.9976821
00:44:31.500 --> 00:44:32.640 and this is a cognitive
NOTE Confidence: 0.9976821
00:44:32.700 --> 00:44:34.300 control region that should be,
NOTE Confidence: 0.998607
00:44:34.619 --> 00:44:36.000 continuing to undergo
NOTE Confidence: 0.9994346
00:44:36.344 --> 00:44:37.405 significant pruning.
NOTE Confidence: 0.9833913
00:44:38.585 --> 00:44:40.045 Lower levels of anandamide
NOTE Confidence: 0.9902277
00:44:40.665 --> 00:44:42.265 were linked with lower volumes
NOTE Confidence: 0.9902277

00:44:42.265 --> 00:44:43.965 in the insula, the cingulate,
NOTE Confidence: 0.9166481

00:44:44.344 --> 00:44:45.484 the occipital cortex,
NOTE Confidence: 0.9601661

00:44:46.025 --> 00:44:47.465 and increased volumes of the
NOTE Confidence: 0.9601661

00:44:47.465 --> 00:44:48.984 caudal middle frontal, which again
NOTE Confidence: 0.9601661

00:44:48.984 --> 00:44:50.265 is another region that really
NOTE Confidence: 0.9601661

00:44:50.265 --> 00:44:52.010 should be going on ongoing
NOTE Confidence: 0.9601661

00:44:52.070 --> 00:44:52.570 pruning.
NOTE Confidence: 0.9915004

00:44:53.910 --> 00:44:55.210 PEA had its own
NOTE Confidence: 0.9622181

00:44:55.830 --> 00:44:57.590 relationships across the board. It
NOTE Confidence: 0.9622181

00:44:57.590 --> 00:44:59.290 was lower levels of PA,
NOTE Confidence: 0.92358154

00:44:59.670 --> 00:45:01.430 lower level lower volumes in
NOTE Confidence: 0.92358154

00:45:01.430 --> 00:45:03.370 the amygdala, insula, cingulate,
NOTE Confidence: 0.98370975

00:45:04.065 --> 00:45:05.425 as well as parietal and
NOTE Confidence: 0.98370975

00:45:05.425 --> 00:45:07.025 occipital regions, and that might
NOTE Confidence: 0.98370975

00:45:07.025 --> 00:45:09.045 actually demonstrate kind of reduced
NOTE Confidence: 0.98370975

00:45:09.185 --> 00:45:10.704 expansion because most of these

NOTE Confidence: 0.98370975
00:45:10.704 --> 00:45:11.364 are fairly,
NOTE Confidence: 0.99773175
00:45:12.224 --> 00:45:13.844 mature at this age range.
NOTE Confidence: 0.99773175
00:45:14.065 --> 00:45:15.825 And then OEA also had,
NOTE Confidence: 0.99773175
00:45:16.145 --> 00:45:17.285 significant relationships
NOTE Confidence: 0.994879
00:45:18.140 --> 00:45:19.340 that overlapped a lot with
NOTE Confidence: 0.994879
00:45:19.340 --> 00:45:20.719 the AEA and PA
NOTE Confidence: 0.9760682
00:45:21.260 --> 00:45:22.700 pattern, but in the opposite
NOTE Confidence: 0.9760682
00:45:22.700 --> 00:45:23.900 direction. So we can talk
NOTE Confidence: 0.9760682
00:45:23.900 --> 00:45:24.700 a little bit about what
NOTE Confidence: 0.9760682
00:45:24.700 --> 00:45:25.680 that might mean.
NOTE Confidence: 0.9800847
00:45:26.620 --> 00:45:28.060 Here, I wanna highlight some
NOTE Confidence: 0.9800847
00:45:28.060 --> 00:45:29.280 studies that found
NOTE Confidence: 0.9748261
00:45:29.580 --> 00:45:30.320 that circulating,
NOTE Confidence: 0.8498933
00:45:31.020 --> 00:45:32.480 an atomide and two AG
NOTE Confidence: 0.8498933
00:45:32.685 --> 00:45:34.145 as well as the lipid,
NOTE Confidence: 0.9969958

00:45:35.645 --> 00:45:36.145 modulators
NOTE Confidence: 0.9795004

00:45:36.765 --> 00:45:37.985 are linked with cognition.
NOTE Confidence: 0.99816215

00:45:38.525 --> 00:45:40.145 So lower two AG
NOTE Confidence: 0.9926491

00:45:40.445 --> 00:45:41.885 was actually linked with better
NOTE Confidence: 0.9926491

00:45:41.885 --> 00:45:42.385 visuospatial
NOTE Confidence: 0.89775455

00:45:42.685 --> 00:45:43.185 accuracy,
NOTE Confidence: 0.9902033

00:45:43.805 --> 00:45:45.005 might demonstrate a bit of
NOTE Confidence: 0.9902033

00:45:45.005 --> 00:45:46.285 a strength in the parietal
NOTE Confidence: 0.9902033

00:45:46.285 --> 00:45:46.785 cortex.
NOTE Confidence: 0.98688984

00:45:47.739 --> 00:45:49.820 In contrast, lower AEA was
NOTE Confidence: 0.98688984

00:45:49.820 --> 00:45:51.739 linked with poor working memory
NOTE Confidence: 0.98688984

00:45:51.739 --> 00:45:53.120 and processing speed,
NOTE Confidence: 0.98261195

00:45:53.420 --> 00:45:54.620 which makes me really wanna
NOTE Confidence: 0.98261195

00:45:54.620 --> 00:45:56.219 map that onto that frontal
NOTE Confidence: 0.98261195

00:45:56.219 --> 00:45:58.380 parietal network and connectivity as
NOTE Confidence: 0.98261195

00:45:58.380 --> 00:45:59.920 well as white matter function.

NOTE Confidence: 0.9223419

00:46:01.425 --> 00:46:03.585 PEA, again, interestingly linked with

NOTE Confidence: 0.9223419

00:46:03.585 --> 00:46:05.665 reduced visual spatial accuracy and

NOTE Confidence: 0.9223419

00:46:05.665 --> 00:46:06.565 math accuracy.

NOTE Confidence: 0.939654

00:46:07.425 --> 00:46:08.785 And then OEA kind of

NOTE Confidence: 0.939654

00:46:08.785 --> 00:46:10.785 behave once again overlapped in

NOTE Confidence: 0.939654

00:46:10.785 --> 00:46:12.145 the same cognitive areas, but

NOTE Confidence: 0.939654

00:46:12.145 --> 00:46:13.765 in the opposite direction. So

NOTE Confidence: 0.9877878

00:46:14.160 --> 00:46:15.520 I'm gonna leave that there,

NOTE Confidence: 0.9877878

00:46:15.520 --> 00:46:16.319 and we can come back

NOTE Confidence: 0.9877878

00:46:16.319 --> 00:46:16.900 to it.

NOTE Confidence: 0.9996085

00:46:17.920 --> 00:46:18.420 Finally,

NOTE Confidence: 0.99968696

00:46:18.719 --> 00:46:20.020 we looked at impulsivity

NOTE Confidence: 0.99845636

00:46:20.400 --> 00:46:21.140 and behavioral

NOTE Confidence: 0.9942349

00:46:21.520 --> 00:46:22.020 approach,

NOTE Confidence: 0.9682129

00:46:22.640 --> 00:46:24.900 kind of self reported symptoms,

NOTE Confidence: 0.978986

00:46:25.440 --> 00:46:26.799 and found that lower two
NOTE Confidence: 0.978986

00:46:26.799 --> 00:46:28.155 AG levels were linked with
NOTE Confidence: 0.978986

00:46:28.395 --> 00:46:30.315 increased negative urgency in the
NOTE Confidence: 0.978986

00:46:30.315 --> 00:46:30.815 females,
NOTE Confidence: 0.97898805

00:46:31.435 --> 00:46:32.955 but positive urgency in the
NOTE Confidence: 0.97898805

00:46:32.955 --> 00:46:34.235 males. Both of these are
NOTE Confidence: 0.97898805

00:46:34.235 --> 00:46:35.915 kind of this interplay of
NOTE Confidence: 0.97898805

00:46:35.915 --> 00:46:36.415 hot,
NOTE Confidence: 0.9888161

00:46:36.875 --> 00:46:37.375 affective,
NOTE Confidence: 0.97371453

00:46:38.075 --> 00:46:40.015 states that in that influence
NOTE Confidence: 0.97371453

00:46:40.155 --> 00:46:40.655 impulsivity
NOTE Confidence: 0.9677191

00:46:41.340 --> 00:46:42.460 and might map on to
NOTE Confidence: 0.9677191

00:46:42.460 --> 00:46:43.280 some of these
NOTE Confidence: 0.99342936

00:46:43.739 --> 00:46:45.680 emotional and cognitive control regions.
NOTE Confidence: 0.99749786

00:46:46.460 --> 00:46:47.920 And both reduced,
NOTE Confidence: 0.99529094

00:46:48.220 --> 00:46:50.380 anandamide and PEA levels were

NOTE Confidence: 0.99529094

00:46:50.380 --> 00:46:51.820 linked with increased lack of

NOTE Confidence: 0.99529094

00:46:51.820 --> 00:46:52.320 perseverance

NOTE Confidence: 0.997231

00:46:52.620 --> 00:46:53.680 and lack of premeditation,

NOTE Confidence: 0.96237206

00:46:54.425 --> 00:46:55.305 which is more of this

NOTE Confidence: 0.96237206

00:46:55.305 --> 00:46:57.085 kind of cold sustained attention

NOTE Confidence: 0.96237206

00:46:57.145 --> 00:46:58.445 and planning areas.

NOTE Confidence: 0.99711335

00:46:59.385 --> 00:47:00.205 With OEA,

NOTE Confidence: 0.9850266

00:47:00.585 --> 00:47:01.705 we got a little smarter

NOTE Confidence: 0.9850266

00:47:01.705 --> 00:47:02.505 here, and we looked for

NOTE Confidence: 0.9850266

00:47:02.505 --> 00:47:04.425 some nonlinear relationships. We did

NOTE Confidence: 0.9850266

00:47:04.425 --> 00:47:05.465 for all of them. But

NOTE Confidence: 0.9850266

00:47:05.465 --> 00:47:06.425 OEA is the only one

NOTE Confidence: 0.9850266

00:47:06.425 --> 00:47:08.125 that had this nonlinear relationship

NOTE Confidence: 0.9850266

00:47:08.185 --> 00:47:10.440 where the midpoint level was

NOTE Confidence: 0.9850266

00:47:10.440 --> 00:47:11.719 actually linked with lack of

NOTE Confidence: 0.9850266

00:47:11.719 --> 00:47:12.219 perseverance
NOTE Confidence: 0.92418945

00:47:12.520 --> 00:47:14.380 similar to AEA and PEA,
NOTE Confidence: 0.89207494

00:47:15.560 --> 00:47:17.160 but lower levels were late
NOTE Confidence: 0.89207494

00:47:17.239 --> 00:47:19.180 linked with increased positive urgency.
NOTE Confidence: 0.8950741

00:47:21.775 --> 00:47:22.675 And, interestingly,
NOTE Confidence: 0.96844584

00:47:23.055 --> 00:47:24.975 both reduced AEA and two
NOTE Confidence: 0.96844584

00:47:24.975 --> 00:47:26.655 AG levels were linked with
NOTE Confidence: 0.96844584

00:47:26.655 --> 00:47:27.155 increased,
NOTE Confidence: 0.9940739

00:47:27.935 --> 00:47:29.775 risk of new onset low
NOTE Confidence: 0.9940739

00:47:29.775 --> 00:47:31.614 level substance use. In the
NOTE Confidence: 0.9940739

00:47:31.614 --> 00:47:33.215 case of AEA, it was
NOTE Confidence: 0.9940739

00:47:33.215 --> 00:47:35.055 linked with slightly heavier use
NOTE Confidence: 0.9940739

00:47:35.055 --> 00:47:36.415 compared to two AG, but
NOTE Confidence: 0.9940739

00:47:36.415 --> 00:47:37.420 this is something that we
NOTE Confidence: 0.9940739

00:47:37.420 --> 00:47:38.960 definitely wanna look at longitudinally.
NOTE Confidence: 0.9904586

00:47:41.180 --> 00:47:42.480 So the kind of preliminary

NOTE Confidence: 0.9904586
00:47:42.620 --> 00:47:44.239 conclusion here is that,
NOTE Confidence: 0.994982
00:47:44.700 --> 00:47:45.180 you know,
NOTE Confidence: 0.9927187
00:47:45.900 --> 00:47:46.960 circulating endocannabinoids
NOTE Confidence: 0.9994186
00:47:47.500 --> 00:47:49.295 is really the only biomarker
NOTE Confidence: 0.9994186
00:47:49.355 --> 00:47:50.954 that we have available to
NOTE Confidence: 0.9994186
00:47:50.954 --> 00:47:52.895 us in the human teenager
NOTE Confidence: 0.9510941
00:47:53.434 --> 00:47:55.275 route, although there are some,
NOTE Confidence: 0.9510941
00:47:55.275 --> 00:47:55.934 you know,
NOTE Confidence: 0.9665512
00:47:56.555 --> 00:47:57.994 being developed including by your
NOTE Confidence: 0.9665512
00:47:57.994 --> 00:47:59.275 group that that I'd like
NOTE Confidence: 0.9665512
00:47:59.275 --> 00:48:00.335 to talk to you about.
NOTE Confidence: 0.9994273
00:48:00.954 --> 00:48:01.454 So
NOTE Confidence: 0.9992488
00:48:02.079 --> 00:48:04.020 we do see significant relationships
NOTE Confidence: 0.9992488
00:48:04.160 --> 00:48:04.980 with endophenotypes
NOTE Confidence: 0.9692146
00:48:05.280 --> 00:48:06.480 that we care about, such
NOTE Confidence: 0.9692146

00:48:06.480 --> 00:48:07.599 as, you know, the development

NOTE Confidence: 0.9692146

00:48:07.599 --> 00:48:09.119 of the prefrontal cortex and

NOTE Confidence: 0.9692146

00:48:09.119 --> 00:48:10.900 limbic system as well

NOTE Confidence: 0.94139254

00:48:11.280 --> 00:48:13.859 as cognitive function, inhibitory control.

NOTE Confidence: 0.97386146

00:48:14.364 --> 00:48:15.325 In the case of two

NOTE Confidence: 0.97386146

00:48:15.325 --> 00:48:16.844 AG, it looks like it's

NOTE Confidence: 0.97386146

00:48:16.844 --> 00:48:17.985 mapping on to,

NOTE Confidence: 0.9836506

00:48:18.285 --> 00:48:20.045 prefrontal volumes as well as

NOTE Confidence: 0.9836506

00:48:20.045 --> 00:48:21.585 affective driven impulsivity

NOTE Confidence: 0.97834104

00:48:22.045 --> 00:48:23.745 and very early experimentation.

NOTE Confidence: 0.99420613

00:48:24.605 --> 00:48:25.745 In the case of anandamide,

NOTE Confidence: 0.94710803

00:48:26.125 --> 00:48:26.864 we see,

NOTE Confidence: 0.98057973

00:48:27.549 --> 00:48:29.469 more cognitive functioning and as

NOTE Confidence: 0.98057973

00:48:29.469 --> 00:48:31.569 well as frontal parietal regions

NOTE Confidence: 0.95886475

00:48:32.030 --> 00:48:34.030 and potentially greater escalation of

NOTE Confidence: 0.95886475

00:48:34.030 --> 00:48:35.069 use at least in these

NOTE Confidence: 0.95886475
00:48:35.069 --> 00:48:35.969 very early,
NOTE Confidence: 0.9979287
00:48:36.430 --> 00:48:37.170 teen years.
NOTE Confidence: 0.9953409
00:48:37.950 --> 00:48:38.829 We do need a lot
NOTE Confidence: 0.9953409
00:48:38.829 --> 00:48:39.869 more evidence to try and
NOTE Confidence: 0.9953409
00:48:39.869 --> 00:48:41.569 understand the underlying mechanisms.
NOTE Confidence: 0.9677791
00:48:42.204 --> 00:48:43.805 You know, these circulating levels,
NOTE Confidence: 0.9677791
00:48:43.805 --> 00:48:45.005 there's some evidence that they
NOTE Confidence: 0.9677791
00:48:45.005 --> 00:48:45.825 map onto,
NOTE Confidence: 0.97898847
00:48:46.525 --> 00:48:48.045 some overflow from the brain.
NOTE Confidence: 0.97898847
00:48:48.045 --> 00:48:48.924 So it might be, you
NOTE Confidence: 0.97898847
00:48:48.924 --> 00:48:50.765 know, indirect measures of brain
NOTE Confidence: 0.97898847
00:48:50.765 --> 00:48:51.265 mechanisms,
NOTE Confidence: 0.92745006
00:48:51.885 --> 00:48:54.065 but primarily, it's peripheral functions.
NOTE Confidence: 0.92745006
00:48:54.204 --> 00:48:55.805 And perhaps these are meaningful
NOTE Confidence: 0.92745006
00:48:55.805 --> 00:48:57.184 and that they impact neurocognition
NOTE Confidence: 0.91283935

00:48:58.070 --> 00:48:59.690 and things like immune function,
NOTE Confidence: 0.91283935

00:48:59.830 --> 00:49:00.330 inflammation,
NOTE Confidence: 0.93485093

00:49:00.950 --> 00:49:03.110 adiposity, metabolic function, and as
NOTE Confidence: 0.93485093

00:49:03.110 --> 00:49:04.310 well as the gut brain
NOTE Confidence: 0.93485093

00:49:04.310 --> 00:49:05.130 kind of microbiome,
NOTE Confidence: 0.99791116

00:49:06.150 --> 00:49:06.650 communication
NOTE Confidence: 0.9985648

00:49:06.950 --> 00:49:07.450 pathway.
NOTE Confidence: 0.96761256

00:49:08.630 --> 00:49:09.130 So,
NOTE Confidence: 0.98417795

00:49:09.510 --> 00:49:10.630 you know, we we talked
NOTE Confidence: 0.98417795

00:49:10.630 --> 00:49:11.430 about it at the Gordon
NOTE Confidence: 0.98417795

00:49:11.430 --> 00:49:12.710 conference, but we definitely we
NOTE Confidence: 0.98417795

00:49:12.790 --> 00:49:14.094 we're doing pretty good with
NOTE Confidence: 0.98417795

00:49:14.094 --> 00:49:15.375 bench to bedside, and we
NOTE Confidence: 0.98417795

00:49:15.375 --> 00:49:16.655 need more of that. But
NOTE Confidence: 0.98417795

00:49:16.655 --> 00:49:17.935 it's also useful to do
NOTE Confidence: 0.98417795

00:49:17.935 --> 00:49:18.655 a little bit of that

NOTE Confidence: 0.98417795

00:49:18.655 --> 00:49:20.655 reverse translation and and talk

NOTE Confidence: 0.98417795

00:49:20.655 --> 00:49:21.715 about what we see,

NOTE Confidence: 0.9937798

00:49:22.495 --> 00:49:23.695 in the human side and

NOTE Confidence: 0.9937798

00:49:23.695 --> 00:49:24.895 try and understand from the

NOTE Confidence: 0.9937798

00:49:24.895 --> 00:49:26.335 preclinical side what that could

NOTE Confidence: 0.9937798

00:49:26.335 --> 00:49:26.835 mean.

NOTE Confidence: 0.9280541

00:49:27.739 --> 00:49:29.680 Just wanna acknowledge the UWM

NOTE Confidence: 0.9280541

00:49:29.739 --> 00:49:30.239 BrainLab.

NOTE Confidence: 0.97667116

00:49:30.859 --> 00:49:31.900 Lots of folks in it,

NOTE Confidence: 0.97667116

00:49:31.900 --> 00:49:33.280 graduate students, alumni,

NOTE Confidence: 0.894559

00:49:33.739 --> 00:49:36.059 faculty, and the endocannabinoid substudy

NOTE Confidence: 0.894559

00:49:36.059 --> 00:49:36.960 with the ABCD.

NOTE Confidence: 0.98948175

00:49:37.420 --> 00:49:38.300 And I will leave it

NOTE Confidence: 0.98948175

00:49:38.300 --> 00:49:39.420 at that so we can

NOTE Confidence: 0.98948175

00:49:39.420 --> 00:49:39.920 chat.

NOTE Confidence: 0.92802596

00:49:45.045 --> 00:49:46.185 Great. Thank you,
NOTE Confidence: 0.88651294

00:49:46.725 --> 00:49:49.305 Krista. There's a, there's a
NOTE Confidence: 0.7842536

00:49:49.844 --> 00:49:50.885 question in the,
NOTE Confidence: 0.9255245

00:49:51.445 --> 00:49:53.364 chat. I'll let, Anahita, maybe
NOTE Confidence: 0.9255245

00:49:53.364 --> 00:49:54.725 you can unmute yourself and
NOTE Confidence: 0.9255245

00:49:54.725 --> 00:49:56.400 ask the question, and I
NOTE Confidence: 0.9255245

00:49:56.400 --> 00:49:58.099 will follow-up through to that
NOTE Confidence: 0.9255245

00:49:58.319 --> 00:49:59.300 specific question.
NOTE Confidence: 0.89824885

00:50:00.160 --> 00:50:02.000 Sure. Thank you. Thank you
NOTE Confidence: 0.89824885

00:50:02.000 --> 00:50:03.940 for great talk. I'm Anahita,
NOTE Confidence: 0.89824885

00:50:04.160 --> 00:50:05.599 and I work with serial
NOTE Confidence: 0.89824885

00:50:05.599 --> 00:50:06.160 on in the in the
NOTE Confidence: 0.89824885

00:50:06.160 --> 00:50:07.460 cannabinoids and cannabinoids.
NOTE Confidence: 0.9697453

00:50:08.605 --> 00:50:09.885 I have two questions. The
NOTE Confidence: 0.9697453

00:50:09.885 --> 00:50:10.765 one that I put in
NOTE Confidence: 0.9697453

00:50:10.765 --> 00:50:11.925 chat is that is there

NOTE Confidence: 0.9697453

00:50:12.045 --> 00:50:13.085 like, when you look into

NOTE Confidence: 0.9697453

00:50:13.085 --> 00:50:15.505 the relationship between aerobic exercise

NOTE Confidence: 0.9697453

00:50:15.725 --> 00:50:17.405 and the cognitive benefits, is

NOTE Confidence: 0.9697453

00:50:17.405 --> 00:50:19.405 this a linear relationship, or

NOTE Confidence: 0.9697453

00:50:19.405 --> 00:50:20.705 is there some amount of

NOTE Confidence: 0.966408

00:50:21.270 --> 00:50:22.469 exercise that you say, okay.

NOTE Confidence: 0.966408

00:50:22.469 --> 00:50:23.590 This is good amount or

NOTE Confidence: 0.966408

00:50:23.590 --> 00:50:24.090 optimal?

NOTE Confidence: 0.99953973

00:50:24.550 --> 00:50:26.330 Yeah. That's a great question.

NOTE Confidence: 0.93600315

00:50:27.190 --> 00:50:28.550 I don't feel like I

NOTE Confidence: 0.93600315

00:50:28.550 --> 00:50:29.850 would say that it's

NOTE Confidence: 0.9974029

00:50:30.469 --> 00:50:31.430 I think that there's a

NOTE Confidence: 0.9974029

00:50:31.430 --> 00:50:31.930 diminishing

NOTE Confidence: 0.97753

00:50:32.310 --> 00:50:33.670 rate of return on the

NOTE Confidence: 0.97753

00:50:33.670 --> 00:50:34.155 really

NOTE Confidence: 0.92885435

00:50:34.475 --> 00:50:36.175 higher end, like, ultra endurance
NOTE Confidence: 0.9820701

00:50:36.475 --> 00:50:37.855 athletes where you're getting,
NOTE Confidence: 0.94737417

00:50:38.795 --> 00:50:40.175 actually a lot of inflammation
NOTE Confidence: 0.98005384

00:50:40.635 --> 00:50:43.035 and perhaps cellular damage. So
NOTE Confidence: 0.98005384

00:50:43.035 --> 00:50:44.795 my guess would be that
NOTE Confidence: 0.98005384

00:50:44.795 --> 00:50:46.315 it's not perfectly linear, you
NOTE Confidence: 0.98005384

00:50:46.315 --> 00:50:47.355 know, that there there is
NOTE Confidence: 0.98005384

00:50:47.355 --> 00:50:48.875 that tipping point that it
NOTE Confidence: 0.98005384

00:50:48.875 --> 00:50:50.750 can become maybe problematic for
NOTE Confidence: 0.98005384

00:50:50.750 --> 00:50:52.030 brain health. I would say
NOTE Confidence: 0.98005384

00:50:52.030 --> 00:50:53.070 in the sample that I
NOTE Confidence: 0.98005384

00:50:53.070 --> 00:50:54.350 have, it's not quite big
NOTE Confidence: 0.98005384

00:50:54.350 --> 00:50:54.850 enough.
NOTE Confidence: 0.9862041

00:50:55.550 --> 00:50:56.590 But when I do a
NOTE Confidence: 0.9862041

00:50:56.590 --> 00:50:57.950 plot, I see a couple
NOTE Confidence: 0.9862041

00:50:57.950 --> 00:50:59.390 at the higher end drop

NOTE Confidence: 0.9862041

00:50:59.390 --> 00:51:01.150 down. It's just, like, not

NOTE Confidence: 0.9862041

00:51:01.150 --> 00:51:02.270 enough of a sample for

NOTE Confidence: 0.9862041

00:51:02.270 --> 00:51:03.330 me to prove it.

NOTE Confidence: 0.9980527

00:51:04.215 --> 00:51:05.975 But in in talking with

NOTE Confidence: 0.9980527

00:51:05.975 --> 00:51:07.415 our lab, like, those were

NOTE Confidence: 0.9980527

00:51:07.415 --> 00:51:08.955 the the, like, really

NOTE Confidence: 0.7658052

00:51:09.255 --> 00:51:11.195 intense almost over exercisers.

NOTE Confidence: 0.99905694

00:51:11.975 --> 00:51:13.335 Yeah. And I'd say that

NOTE Confidence: 0.99905694

00:51:13.335 --> 00:51:14.775 they also fell into

NOTE Confidence: 0.9794002

00:51:15.989 --> 00:51:17.350 we did exclude for eating

NOTE Confidence: 0.9794002

00:51:17.350 --> 00:51:18.870 disorders, but they almost fell

NOTE Confidence: 0.9794002

00:51:18.870 --> 00:51:20.890 into kind of impulsive exercise,

NOTE Confidence: 0.9703277

00:51:21.750 --> 00:51:24.310 you know, perhaps problematic eating

NOTE Confidence: 0.9703277

00:51:24.310 --> 00:51:26.070 patterns. Yeah. Yeah. So too

NOTE Confidence: 0.9703277

00:51:26.070 --> 00:51:27.765 much exercise is not healthy.

NOTE Confidence: 0.9703277

00:51:28.085 --> 00:51:28.885 Yeah. I mean, when I
NOTE Confidence: 0.9703277

00:51:28.885 --> 00:51:30.585 talk to my exercise physiology
NOTE Confidence: 0.9703277

00:51:30.805 --> 00:51:32.344 folks, they're like, that's definitely
NOTE Confidence: 0.9703277

00:51:32.565 --> 00:51:34.244 been shown. It's just not
NOTE Confidence: 0.9703277

00:51:34.244 --> 00:51:35.385 usually with neuroimaging.
NOTE Confidence: 0.98033684

00:51:35.844 --> 00:51:37.285 You know? Yeah. Okay. Thank
NOTE Confidence: 0.98033684

00:51:37.285 --> 00:51:38.565 you. And my second question
NOTE Confidence: 0.98033684

00:51:38.565 --> 00:51:39.625 is about the
NOTE Confidence: 0.97474104

00:51:40.110 --> 00:51:41.230 relationship between,
NOTE Confidence: 0.8249678

00:51:42.030 --> 00:51:43.390 lower to AGN and under
NOTE Confidence: 0.8249678

00:51:43.390 --> 00:51:45.170 my with early substance use.
NOTE Confidence: 0.8249678

00:51:45.390 --> 00:51:46.910 And I believe it was
NOTE Confidence: 0.8249678

00:51:46.910 --> 00:51:48.290 an ABCD study,
NOTE Confidence: 0.8881912

00:51:48.670 --> 00:51:49.570 if I'm right.
NOTE Confidence: 0.89163154

00:51:50.030 --> 00:51:51.870 Yeah, every substance use. So
NOTE Confidence: 0.89163154

00:51:51.870 --> 00:51:53.025 is it like cross section,

NOTE Confidence: 0.89163154
00:51:53.105 --> 00:51:54.305 like, at the same time
NOTE Confidence: 0.89163154
00:51:54.305 --> 00:51:56.065 that their levels were low,
NOTE Confidence: 0.89163154
00:51:56.065 --> 00:51:58.305 also they already started the
NOTE Confidence: 0.89163154
00:51:58.305 --> 00:51:59.825 substance use, or is it,
NOTE Confidence: 0.89163154
00:51:59.825 --> 00:52:01.045 like, before or after?
NOTE Confidence: 0.9825492
00:52:01.424 --> 00:52:03.204 Yeah. In that case, it's
NOTE Confidence: 0.9825492
00:52:03.344 --> 00:52:04.864 it's actually looking at just
NOTE Confidence: 0.9825492
00:52:04.864 --> 00:52:06.164 the time point after,
NOTE Confidence: 0.99819595
00:52:06.560 --> 00:52:07.520 so whether or not they
NOTE Confidence: 0.99819595
00:52:07.520 --> 00:52:09.140 had, like, a new onset
NOTE Confidence: 0.98798436
00:52:09.680 --> 00:52:10.180 after.
NOTE Confidence: 0.9895118
00:52:10.960 --> 00:52:12.320 After. So it's not the
NOTE Confidence: 0.9895118
00:52:12.320 --> 00:52:14.000 same time. So it's it
NOTE Confidence: 0.9895118
00:52:14.000 --> 00:52:15.920 cannot be because of that
NOTE Confidence: 0.9895118
00:52:15.920 --> 00:52:17.380 substance that they are using.
NOTE Confidence: 0.98204845

00:52:18.880 --> 00:52:19.380 Correct.
NOTE Confidence: 0.964581

00:52:19.955 --> 00:52:21.555 Yeah. It's not perfect. Like,
NOTE Confidence: 0.964581

00:52:21.555 --> 00:52:23.715 that analysis isn't perfect at
NOTE Confidence: 0.964581

00:52:23.715 --> 00:52:24.455 at disentangling
NOTE Confidence: 0.99577796

00:52:24.835 --> 00:52:26.355 that, but the the use
NOTE Confidence: 0.99577796

00:52:26.355 --> 00:52:27.015 is very
NOTE Confidence: 0.9702012

00:52:27.475 --> 00:52:29.335 low. So we're really interpreting
NOTE Confidence: 0.9702012

00:52:29.395 --> 00:52:31.075 it more as, like, new
NOTE Confidence: 0.9702012

00:52:31.075 --> 00:52:33.015 onsets because it it's like
NOTE Confidence: 0.9702012

00:52:33.090 --> 00:52:34.630 they've had a few puffs
NOTE Confidence: 0.9628657

00:52:34.930 --> 00:52:36.450 of nicotine or they've had
NOTE Confidence: 0.9628657

00:52:36.450 --> 00:52:37.830 a few puffs of cannabis
NOTE Confidence: 0.9628657

00:52:37.890 --> 00:52:39.430 or some sips of alcohol.
NOTE Confidence: 0.9095377

00:52:39.810 --> 00:52:40.850 In the case of two
NOTE Confidence: 0.9095377

00:52:40.850 --> 00:52:41.830 AG with anandamide,
NOTE Confidence: 0.9669115

00:52:42.530 --> 00:52:43.410 they might have had, like,

NOTE Confidence: 0.9669115

00:52:43.410 --> 00:52:44.390 a full drink

NOTE Confidence: 0.9658307

00:52:44.930 --> 00:52:45.969 and a little bit more,

NOTE Confidence: 0.9658307

00:52:45.969 --> 00:52:47.090 but it it's still very

NOTE Confidence: 0.9658307

00:52:47.090 --> 00:52:49.385 low level use. Yeah. But

NOTE Confidence: 0.9658307

00:52:49.385 --> 00:52:50.665 our goal is now that

NOTE Confidence: 0.9658307

00:52:50.665 --> 00:52:52.525 we've we've collected some longitudinal

NOTE Confidence: 0.9658307

00:52:52.585 --> 00:52:53.785 data to look at exactly

NOTE Confidence: 0.9658307

00:52:53.785 --> 00:52:55.085 that to try and disentangle,

NOTE Confidence: 0.95447767

00:52:56.105 --> 00:52:57.864 certainly cannabis effects, but alcohol

NOTE Confidence: 0.95447767

00:52:57.864 --> 00:52:59.785 could also affect Yeah. The

NOTE Confidence: 0.95447767

00:52:59.785 --> 00:53:01.464 endocannabinoid levels. So we'll be

NOTE Confidence: 0.95447767

00:53:01.464 --> 00:53:03.244 looking at that kind of,

NOTE Confidence: 0.9440842

00:53:04.250 --> 00:53:05.450 more of a cross linked

NOTE Confidence: 0.9440842

00:53:05.450 --> 00:53:07.290 analysis to see more of

NOTE Confidence: 0.9440842

00:53:07.290 --> 00:53:08.349 the causal pathways.

NOTE Confidence: 0.9671755

00:53:08.650 --> 00:53:09.530 And may I ask what
NOTE Confidence: 0.9671755

00:53:09.530 --> 00:53:10.910 was your sample size?
NOTE Confidence: 0.927314

00:53:12.010 --> 00:53:13.290 For that one, it's about
NOTE Confidence: 0.927314

00:53:13.290 --> 00:53:14.969 four hundred and thirty. Okay.
NOTE Confidence: 0.927314

00:53:14.969 --> 00:53:16.410 So that's a good spot.
NOTE Confidence: 0.927314

00:53:16.410 --> 00:53:17.770 Yeah. But we're up to
NOTE Confidence: 0.927314

00:53:17.770 --> 00:53:19.715 about eighteen hundred. The goal
NOTE Confidence: 0.927314

00:53:19.715 --> 00:53:21.315 is is to get two
NOTE Confidence: 0.927314

00:53:21.315 --> 00:53:21.815 thousand.
NOTE Confidence: 0.9651773

00:53:22.435 --> 00:53:23.975 Wow. That's that's wonderful.
NOTE Confidence: 0.9986076

00:53:24.435 --> 00:53:24.935 Yeah.
NOTE Confidence: 0.8418896

00:53:25.955 --> 00:53:27.155 It's Thank you so much.
NOTE Confidence: 0.8418896

00:53:27.235 --> 00:53:28.275 On that in the background.
NOTE Confidence: 0.8418896

00:53:28.275 --> 00:53:29.015 So yeah.
NOTE Confidence: 0.96592724

00:53:29.315 --> 00:53:30.215 Very exciting.
NOTE Confidence: 0.999862

00:53:30.515 --> 00:53:31.495 Yeah. Thank you.

NOTE Confidence: 0.9926361
00:53:32.195 --> 00:53:33.015 Other questions?
NOTE Confidence: 0.9436191
00:53:35.690 --> 00:53:36.809 I just wanted to draw
NOTE Confidence: 0.9436191
00:53:36.809 --> 00:53:38.329 your attention, Krista, to this
NOTE Confidence: 0.9436191
00:53:38.329 --> 00:53:40.329 paper in JAMA Psychiatry that
NOTE Confidence: 0.9436191
00:53:40.329 --> 00:53:41.930 just came out, I think,
NOTE Confidence: 0.9436191
00:53:41.930 --> 00:53:42.410 last,
NOTE Confidence: 0.9335688
00:53:42.890 --> 00:53:45.230 last week showing that exercise
NOTE Confidence: 0.9335688
00:53:45.450 --> 00:53:46.109 did not
NOTE Confidence: 0.9968397
00:53:47.935 --> 00:53:49.315 seem to have an effect
NOTE Confidence: 0.9567443
00:53:50.015 --> 00:53:51.155 on hippocampal,
NOTE Confidence: 0.86708605
00:53:52.815 --> 00:53:54.515 volume in cannabis users.
NOTE Confidence: 0.95004785
00:53:56.255 --> 00:53:57.474 I thought that would be
NOTE Confidence: 0.95004785
00:53:57.695 --> 00:53:59.954 very relevant to your Yes.
NOTE Confidence: 0.95004785
00:54:00.094 --> 00:54:02.580 Absolutely. To your work. So
NOTE Confidence: 0.95004785
00:54:02.580 --> 00:54:04.260 I my I have a
NOTE Confidence: 0.95004785

00:54:04.260 --> 00:54:05.780 kind of more basic question
NOTE Confidence: 0.95004785

00:54:05.780 --> 00:54:06.280 that,
NOTE Confidence: 0.97541827

00:54:06.900 --> 00:54:08.360 that I've been struggling with,
NOTE Confidence: 0.95465046

00:54:08.980 --> 00:54:10.420 and that is in many
NOTE Confidence: 0.95465046

00:54:10.420 --> 00:54:11.880 of many grant applications
NOTE Confidence: 0.9192075

00:54:12.260 --> 00:54:13.800 we've considered, for example,
NOTE Confidence: 0.909211

00:54:15.364 --> 00:54:16.825 we've flirted with the idea
NOTE Confidence: 0.9974277

00:54:17.125 --> 00:54:18.344 of collecting endocannabinoid
NOTE Confidence: 0.9578913

00:54:18.724 --> 00:54:21.385 levels, peripheral endocannabinoid levels. And,
NOTE Confidence: 0.93373495

00:54:22.244 --> 00:54:23.364 the the times that I
NOTE Confidence: 0.93373495

00:54:23.364 --> 00:54:25.305 proposed them, we often got,
NOTE Confidence: 0.93373495

00:54:25.445 --> 00:54:26.105 you know,
NOTE Confidence: 0.9839962

00:54:26.559 --> 00:54:29.059 pushback from reviewers saying, well,
NOTE Confidence: 0.7523656

00:54:29.520 --> 00:54:30.180 what is
NOTE Confidence: 0.9148641

00:54:30.640 --> 00:54:32.719 peripheral anandamide and two AG
NOTE Confidence: 0.9148641

00:54:32.719 --> 00:54:33.920 tell you about what's happening

NOTE Confidence: 0.9148641
00:54:33.920 --> 00:54:34.960 in the brain if you're
NOTE Confidence: 0.9148641
00:54:34.960 --> 00:54:36.160 already interested in the brain?
NOTE Confidence: 0.9148641
00:54:36.160 --> 00:54:36.660 And
NOTE Confidence: 0.9485891
00:54:37.039 --> 00:54:38.799 I'd be curious what, you
NOTE Confidence: 0.9485891
00:54:38.799 --> 00:54:40.400 know, what your take on
NOTE Confidence: 0.9485891
00:54:40.400 --> 00:54:41.299 that is.
NOTE Confidence: 0.99171394
00:54:42.075 --> 00:54:43.355 Yeah. No. I think that
NOTE Confidence: 0.99171394
00:54:43.355 --> 00:54:43.855 it's,
NOTE Confidence: 0.98772335
00:54:47.915 --> 00:54:49.195 it's one of those things
NOTE Confidence: 0.98772335
00:54:49.195 --> 00:54:51.214 where we're still figuring out,
NOTE Confidence: 0.98772335
00:54:51.355 --> 00:54:51.855 admittedly.
NOTE Confidence: 0.9963948
00:54:52.315 --> 00:54:53.295 You know? And
NOTE Confidence: 0.97743577
00:54:55.290 --> 00:54:57.130 the animal research does show
NOTE Confidence: 0.97743577
00:54:57.130 --> 00:54:58.570 that it it is highly
NOTE Confidence: 0.97743577
00:54:58.570 --> 00:55:00.090 correlated with the brain levels
NOTE Confidence: 0.97743577

00:55:00.090 --> 00:55:00.969 and, you know, and it's
NOTE Confidence: 0.97743577

00:55:01.050 --> 00:55:02.250 and some of it is
NOTE Confidence: 0.97743577

00:55:02.250 --> 00:55:02.750 overflow
NOTE Confidence: 0.9809336

00:55:03.050 --> 00:55:03.950 from the brain,
NOTE Confidence: 0.99793166

00:55:04.330 --> 00:55:05.710 but that needs to be
NOTE Confidence: 0.99793166

00:55:05.930 --> 00:55:07.210 reconfirmed. Like, I don't think
NOTE Confidence: 0.99793166

00:55:07.210 --> 00:55:09.450 that that's fully accepted across
NOTE Confidence: 0.99793166

00:55:09.450 --> 00:55:10.755 everyone by any stretch.
NOTE Confidence: 0.98977584

00:55:13.634 --> 00:55:14.515 And, you know, I think
NOTE Confidence: 0.98977584

00:55:14.515 --> 00:55:15.875 what's really compelling to me
NOTE Confidence: 0.98977584

00:55:15.875 --> 00:55:16.914 is that there's been a
NOTE Confidence: 0.98977584

00:55:16.914 --> 00:55:18.614 lot of research in adults
NOTE Confidence: 0.98977584

00:55:18.674 --> 00:55:20.994 linking these circulating levels with
NOTE Confidence: 0.98977584

00:55:20.994 --> 00:55:22.835 phenotypes that we're very interested
NOTE Confidence: 0.98977584

00:55:22.835 --> 00:55:24.535 in, like stress response,
NOTE Confidence: 0.96971816

00:55:25.150 --> 00:55:27.330 like in response to exercise,

NOTE Confidence: 0.9996278

00:55:27.950 --> 00:55:28.450 mood,

NOTE Confidence: 0.9183386

00:55:30.190 --> 00:55:31.890 executive functioning, memory.

NOTE Confidence: 0.9975132

00:55:32.190 --> 00:55:33.390 And so, you know, if

NOTE Confidence: 0.9975132

00:55:33.390 --> 00:55:35.150 it's if it's not brain

NOTE Confidence: 0.9975132

00:55:35.150 --> 00:55:36.670 levels, then it's telling us

NOTE Confidence: 0.9975132

00:55:36.670 --> 00:55:38.510 something about the peripheral health

NOTE Confidence: 0.9975132

00:55:38.510 --> 00:55:40.370 system that maybe we're ignoring

NOTE Confidence: 0.89356446

00:55:41.125 --> 00:55:41.705 too much.

NOTE Confidence: 0.97671086

00:55:42.165 --> 00:55:43.145 You know? And maybe,

NOTE Confidence: 0.97789943

00:55:44.085 --> 00:55:45.364 especially, you know, it's it's

NOTE Confidence: 0.97789943

00:55:45.364 --> 00:55:47.364 released on demand to stress,

NOTE Confidence: 0.97789943

00:55:47.364 --> 00:55:48.985 to pain, to exercise.

NOTE Confidence: 0.99833715

00:55:49.765 --> 00:55:51.045 And maybe what we're tapping

NOTE Confidence: 0.99833715

00:55:51.045 --> 00:55:52.325 into is more of this

NOTE Confidence: 0.99833715

00:55:52.325 --> 00:55:54.025 kind of stress and physical

NOTE Confidence: 0.99833715

00:55:54.165 --> 00:55:55.385 health characteristics
NOTE Confidence: 0.99722385

00:55:56.420 --> 00:55:57.780 that are that are very
NOTE Confidence: 0.99722385

00:55:57.780 --> 00:55:59.160 linked with brain health.
NOTE Confidence: 0.9949471

00:56:00.340 --> 00:56:00.840 So,
NOTE Confidence: 0.96610105

00:56:01.620 --> 00:56:02.739 you know, I guess it
NOTE Confidence: 0.96610105

00:56:02.739 --> 00:56:03.940 it depends a little bit
NOTE Confidence: 0.96610105

00:56:03.940 --> 00:56:05.620 on your tolerance for some
NOTE Confidence: 0.96610105

00:56:05.620 --> 00:56:07.300 ambiguity in science. You know,
NOTE Confidence: 0.96610105

00:56:07.300 --> 00:56:08.420 I think that the you
NOTE Confidence: 0.96610105

00:56:08.420 --> 00:56:09.700 know, I try and just
NOTE Confidence: 0.96610105

00:56:09.700 --> 00:56:10.925 set to set up the
NOTE Confidence: 0.96610105

00:56:10.925 --> 00:56:12.465 theory as much as possible
NOTE Confidence: 0.96610105

00:56:12.525 --> 00:56:13.985 and then test it and,
NOTE Confidence: 0.96125805

00:56:15.085 --> 00:56:17.185 and hopefully continue to collaborate
NOTE Confidence: 0.96125805

00:56:17.245 --> 00:56:18.864 really closely with more preclinical
NOTE Confidence: 0.9980562

00:56:19.645 --> 00:56:21.425 models that that could

NOTE Confidence: 0.9974524
00:56:21.725 --> 00:56:23.485 measure the peripheral levels with
NOTE Confidence: 0.9974524
00:56:23.485 --> 00:56:24.605 the brain and start to
NOTE Confidence: 0.9974524
00:56:24.605 --> 00:56:26.219 really inform us better about
NOTE Confidence: 0.9974524
00:56:26.219 --> 00:56:27.840 what exactly this means.
NOTE Confidence: 0.9866253
00:56:29.660 --> 00:56:30.400 But we're
NOTE Confidence: 0.9698668
00:56:31.580 --> 00:56:32.860 we're left a little bit
NOTE Confidence: 0.9698668
00:56:32.860 --> 00:56:33.900 with like, for me, if
NOTE Confidence: 0.9698668
00:56:33.900 --> 00:56:34.880 I find longitudinally
NOTE Confidence: 0.9929426
00:56:35.340 --> 00:56:36.780 that that the onset of
NOTE Confidence: 0.9929426
00:56:36.780 --> 00:56:37.280 cannabis
NOTE Confidence: 0.9159975
00:56:37.739 --> 00:56:39.260 and I have longitudinal data
NOTE Confidence: 0.9159975
00:56:39.500 --> 00:56:41.265 Right. And and it significantly
NOTE Confidence: 0.99912447
00:56:41.645 --> 00:56:42.145 reduces
NOTE Confidence: 0.9856297
00:56:42.525 --> 00:56:43.265 or increases
NOTE Confidence: 0.97717214
00:56:43.645 --> 00:56:45.025 or disrupts the endocannabinoid
NOTE Confidence: 0.9766811

00:56:45.485 --> 00:56:47.585 circulating system, and that predicts

NOTE Confidence: 0.9766811

00:56:47.725 --> 00:56:48.864 changes in cognition

NOTE Confidence: 0.9369564

00:56:49.165 --> 00:56:50.225 and brain structure.

NOTE Confidence: 0.9640643

00:56:51.725 --> 00:56:53.565 That's a pretty compelling model.

NOTE Confidence: 0.9640643

00:56:53.565 --> 00:56:55.105 That's pretty compelling evidence,

NOTE Confidence: 0.9812106

00:56:55.480 --> 00:56:56.520 and I put it out

NOTE Confidence: 0.9812106

00:56:56.520 --> 00:56:58.440 there. And I remain very

NOTE Confidence: 0.9812106

00:56:58.440 --> 00:56:59.719 open to someone saying, well,

NOTE Confidence: 0.9812106

00:56:59.719 --> 00:57:01.239 that that's not the brain.

NOTE Confidence: 0.9812106

00:57:01.239 --> 00:57:02.440 You're not measuring the brain.

NOTE Confidence: 0.9812106

00:57:02.440 --> 00:57:04.520 That's the peripheral system. Okay.

NOTE Confidence: 0.9812106

00:57:04.520 --> 00:57:06.120 Well, then that means that

NOTE Confidence: 0.9812106

00:57:06.120 --> 00:57:06.620 cannabis

NOTE Confidence: 0.9983201

00:57:06.920 --> 00:57:08.219 use is disrupting

NOTE Confidence: 0.98094326

00:57:08.675 --> 00:57:10.355 the peripheral system, including the

NOTE Confidence: 0.98094326

00:57:10.355 --> 00:57:11.635 immune system or maybe the

NOTE Confidence: 0.98094326
00:57:11.635 --> 00:57:12.455 gut microbiome.
NOTE Confidence: 0.98605835
00:57:12.835 --> 00:57:13.555 You know, what do we
NOTE Confidence: 0.98605835
00:57:13.555 --> 00:57:14.675 need to measure to tap
NOTE Confidence: 0.98605835
00:57:14.675 --> 00:57:15.655 into that better?
NOTE Confidence: 0.99945915
00:57:15.955 --> 00:57:16.615 Is it
NOTE Confidence: 0.9988984
00:57:16.994 --> 00:57:18.435 is it through these physical
NOTE Confidence: 0.9988984
00:57:18.435 --> 00:57:19.335 health aspects?
NOTE Confidence: 0.99855006
00:57:20.940 --> 00:57:22.140 Interesting. Do you know if
NOTE Confidence: 0.99855006
00:57:22.140 --> 00:57:23.579 anyone has actually looked at,
NOTE Confidence: 0.8114565
00:57:24.380 --> 00:57:24.880 at,
NOTE Confidence: 0.9971667
00:57:26.460 --> 00:57:28.320 CSF levels of endocannabinoids
NOTE Confidence: 0.98676825
00:57:28.780 --> 00:57:30.300 and related them to peripheral
NOTE Confidence: 0.98676825
00:57:30.300 --> 00:57:31.980 levels? They have. And so
NOTE Confidence: 0.98676825
00:57:31.980 --> 00:57:33.339 that research has been done
NOTE Confidence: 0.98676825
00:57:33.339 --> 00:57:34.619 and validated, and it's highly
NOTE Confidence: 0.98676825

00:57:34.619 --> 00:57:35.119 correlated.
NOTE Confidence: 0.99071354

00:57:35.420 --> 00:57:36.915 Okay. It's just we can't
NOTE Confidence: 0.99071354

00:57:36.915 --> 00:57:38.195 do spinal taps.
NOTE Confidence: 0.9909807

00:57:38.515 --> 00:57:39.735 I see there's another
NOTE Confidence: 0.87098515

00:57:40.115 --> 00:57:40.935 and yeah.
NOTE Confidence: 0.6479611

00:57:41.315 --> 00:57:41.815 Arnab?
NOTE Confidence: 0.94447106

00:57:43.475 --> 00:57:45.335 Hi. That was an amazing
NOTE Confidence: 0.94447106

00:57:45.395 --> 00:57:45.895 presentation.
NOTE Confidence: 0.93635845

00:57:47.235 --> 00:57:48.755 I'm a postdoc also working
NOTE Confidence: 0.93635845

00:57:48.755 --> 00:57:50.490 with, the synergy group. I
NOTE Confidence: 0.93635845

00:57:50.490 --> 00:57:51.530 just had a quick question
NOTE Confidence: 0.93635845

00:57:51.530 --> 00:57:52.010 about the,
NOTE Confidence: 0.9383581

00:57:52.810 --> 00:57:53.950 exercise study.
NOTE Confidence: 0.9752345

00:57:54.250 --> 00:57:55.770 Mhmm. Did you also control
NOTE Confidence: 0.9752345

00:57:55.770 --> 00:57:56.890 for BMI? I might have
NOTE Confidence: 0.9752345

00:57:56.890 --> 00:57:58.170 missed that. BMI and body

NOTE Confidence: 0.9752345

00:57:58.170 --> 00:57:58.910 fat percentage?

NOTE Confidence: 0.9884372

00:57:59.290 --> 00:58:00.730 Yes. I did. And so

NOTE Confidence: 0.9884372

00:58:00.730 --> 00:58:02.270 those the effects of aerobic

NOTE Confidence: 0.9884372

00:58:02.330 --> 00:58:03.470 fitness are,

NOTE Confidence: 0.9677196

00:58:04.105 --> 00:58:05.865 above and beyond BMI. And,

NOTE Confidence: 0.9677196

00:58:05.865 --> 00:58:07.085 interestingly, BMI,

NOTE Confidence: 0.99439037

00:58:08.025 --> 00:58:09.645 in this cohort wasn't

NOTE Confidence: 0.99942374

00:58:10.025 --> 00:58:10.525 particularly

NOTE Confidence: 0.92967236

00:58:10.825 --> 00:58:12.025 related because I looked at

NOTE Confidence: 0.97879475

00:58:12.985 --> 00:58:14.025 when I designed the study,

NOTE Confidence: 0.97879475

00:58:14.025 --> 00:58:15.065 I looked at BMI. I

NOTE Confidence: 0.97879475

00:58:15.065 --> 00:58:16.045 looked at nutrition,

NOTE Confidence: 0.9466321

00:58:16.425 --> 00:58:18.285 VO two max, and accelerometer

NOTE Confidence: 0.75261337

00:58:18.665 --> 00:58:19.325 data because

NOTE Confidence: 0.97324497

00:58:19.760 --> 00:58:20.880 there you know, there's people

NOTE Confidence: 0.97324497

00:58:20.880 --> 00:58:22.819 that are very sedentary,
NOTE Confidence: 0.977938

00:58:23.599 --> 00:58:25.280 for example, but then do
NOTE Confidence: 0.977938

00:58:25.280 --> 00:58:26.640 these, like, big workouts so
NOTE Confidence: 0.977938

00:58:26.640 --> 00:58:27.760 their VO tax is okay,
NOTE Confidence: 0.977938

00:58:27.760 --> 00:58:28.720 but they also have these
NOTE Confidence: 0.977938

00:58:28.720 --> 00:58:30.660 huge bouts of sedentary behavior.
NOTE Confidence: 0.977938

00:58:30.880 --> 00:58:31.920 So if you're getting into
NOTE Confidence: 0.977938

00:58:31.920 --> 00:58:33.405 that field, all of those
NOTE Confidence: 0.977938

00:58:33.405 --> 00:58:34.685 seem to be related in
NOTE Confidence: 0.977938

00:58:34.685 --> 00:58:36.545 their own way to cognition.
NOTE Confidence: 0.9336584

00:58:37.245 --> 00:58:38.365 What I saw, at least
NOTE Confidence: 0.9336584

00:58:38.365 --> 00:58:39.565 in this cohort, that was
NOTE Confidence: 0.9336584

00:58:39.565 --> 00:58:40.685 the VO two max in
NOTE Confidence: 0.9336584

00:58:40.685 --> 00:58:41.185 particular
NOTE Confidence: 0.9745797

00:58:41.565 --> 00:58:43.265 was the most robust predictor.
NOTE Confidence: 0.9745797

00:58:43.325 --> 00:58:44.205 So that's kind of what

NOTE Confidence: 0.9745797

00:58:44.205 --> 00:58:45.645 I've used to look at,

NOTE Confidence: 0.9745797

00:58:45.965 --> 00:58:47.745 in relation to cannabis use.

NOTE Confidence: 0.9160208

00:58:48.960 --> 00:58:50.320 And just a follow-up, like,

NOTE Confidence: 0.9160208

00:58:50.320 --> 00:58:51.380 speculative question.

NOTE Confidence: 0.9883109

00:58:52.560 --> 00:58:54.000 If some someone stops using

NOTE Confidence: 0.9883109

00:58:54.000 --> 00:58:55.600 cannabis and then increases their

NOTE Confidence: 0.9883109

00:58:55.600 --> 00:58:56.560 VO two max by an

NOTE Confidence: 0.9883109

00:58:56.560 --> 00:58:58.160 exercise regimen, do you think

NOTE Confidence: 0.9883109

00:58:58.160 --> 00:58:59.440 it would have, like, an

NOTE Confidence: 0.9883109

00:58:59.440 --> 00:59:02.100 increased effect or beneficial effect?

NOTE Confidence: 0.99012727

00:59:03.485 --> 00:59:04.925 Like, more than someone who

NOTE Confidence: 0.99012727

00:59:04.925 --> 00:59:06.625 didn't stop cannabis use?

NOTE Confidence: 0.9764037

00:59:08.765 --> 00:59:09.825 You know, statistically,

NOTE Confidence: 0.9449196

00:59:10.125 --> 00:59:11.405 probably, you know, because we

NOTE Confidence: 0.9449196

00:59:11.405 --> 00:59:12.385 know when,

NOTE Confidence: 0.9904645

00:59:13.805 --> 00:59:15.325 you have an opportunity to
NOTE Confidence: 0.9904645

00:59:15.325 --> 00:59:16.705 see a bigger improvement,
NOTE Confidence: 0.9973308

00:59:17.085 --> 00:59:18.830 that effect, you know, tends
NOTE Confidence: 0.9973308

00:59:18.830 --> 00:59:20.610 to be more statistically significant.
NOTE Confidence: 0.98249376

00:59:21.150 --> 00:59:23.150 So, yeah, I I would
NOTE Confidence: 0.98249376

00:59:23.150 --> 00:59:24.990 suspect that they'd they'd be
NOTE Confidence: 0.98249376

00:59:24.990 --> 00:59:26.770 particularly benefit. Also,
NOTE Confidence: 0.95920765

00:59:27.150 --> 00:59:28.270 at least in theory, again,
NOTE Confidence: 0.95920765

00:59:28.270 --> 00:59:29.230 we don't have a lot
NOTE Confidence: 0.95920765

00:59:29.230 --> 00:59:30.825 of evidence in humans that
NOTE Confidence: 0.95920765

00:59:30.984 --> 00:59:32.925 cannabis use results in dysregulation
NOTE Confidence: 0.95920765

00:59:33.145 --> 00:59:34.685 of anandamide and two AG.
NOTE Confidence: 0.95920765

00:59:34.905 --> 00:59:35.405 But
NOTE Confidence: 0.99858284

00:59:35.785 --> 00:59:37.005 if part of the mechanism
NOTE Confidence: 0.99858284

00:59:37.065 --> 00:59:38.525 there is is reregulating
NOTE Confidence: 0.9610632

00:59:38.825 --> 00:59:40.204 that and having an upregulation

NOTE Confidence: 0.9610632
00:59:40.425 --> 00:59:41.385 of the c b one
NOTE Confidence: 0.9610632
00:59:41.385 --> 00:59:43.145 receptors and just having better,
NOTE Confidence: 0.9610632
00:59:43.464 --> 00:59:43.964 signaling,
NOTE Confidence: 0.9905812
00:59:44.780 --> 00:59:45.579 then I would think they
NOTE Confidence: 0.9905812
00:59:45.579 --> 00:59:46.800 would benefit more.
NOTE Confidence: 0.9803609
00:59:48.140 --> 00:59:50.060 But that's my next grant.
NOTE Confidence: 0.9803609
00:59:50.060 --> 00:59:50.700 You know, I have to
NOTE Confidence: 0.9803609
00:59:50.700 --> 00:59:52.060 write the, like, clinical trial.
NOTE Confidence: 0.9803609
00:59:52.060 --> 00:59:53.500 ABCD took over my life,
NOTE Confidence: 0.9803609
00:59:53.500 --> 00:59:54.400 so I haven't
NOTE Confidence: 0.93214387
00:59:55.420 --> 00:59:56.619 been Thank you so much.
NOTE Confidence: 0.93214387
00:59:56.619 --> 00:59:57.820 Yeah. Thank you. Nice to
NOTE Confidence: 0.93214387
00:59:57.820 --> 00:59:58.480 meet you.
NOTE Confidence: 0.9549877
00:59:59.805 --> 01:00:01.585 Thank you very much, Krista.
NOTE Confidence: 0.9652909
01:00:02.605 --> 01:00:03.345 We are,
NOTE Confidence: 0.95838714

01:00:04.685 --> 01:00:06.365 you know, it's so great
NOTE Confidence: 0.95838714

01:00:06.365 --> 01:00:07.244 that you were able to
NOTE Confidence: 0.95838714

01:00:07.244 --> 01:00:08.865 do this at, you know,
NOTE Confidence: 0.9805031

01:00:09.165 --> 01:00:11.085 and I'm sure everyone has
NOTE Confidence: 0.9805031

01:00:11.085 --> 01:00:13.260 really enjoyed this. And, again,
NOTE Confidence: 0.9805031

01:00:13.260 --> 01:00:14.700 the the talk is recorded,
NOTE Confidence: 0.9805031

01:00:14.700 --> 01:00:15.980 and it's gonna be available
NOTE Confidence: 0.9805031

01:00:15.980 --> 01:00:17.340 on our on our website.
NOTE Confidence: 0.9805031

01:00:17.340 --> 01:00:18.300 So I'm sure people are
NOTE Confidence: 0.9805031

01:00:18.300 --> 01:00:19.440 gonna look at it,
NOTE Confidence: 0.8592857

01:00:20.620 --> 01:00:21.120 in,
NOTE Confidence: 0.9793638

01:00:21.820 --> 01:00:22.940 in in the months to
NOTE Confidence: 0.9793638

01:00:22.940 --> 01:00:24.540 come. So I really appreciate,
NOTE Confidence: 0.9793638

01:00:24.540 --> 01:00:25.820 and I I'm gonna be
NOTE Confidence: 0.9793638

01:00:25.820 --> 01:00:26.700 in touch with you to
NOTE Confidence: 0.9793638

01:00:26.700 --> 01:00:27.920 talk to you about potential,

NOTE Confidence: 0.7949054
01:00:29.015 --> 01:00:29.515 collaboration.
NOTE Confidence: 0.9873545
01:00:30.215 --> 01:00:31.415 So Yeah. I wanted I
NOTE Confidence: 0.9873545
01:00:31.415 --> 01:00:32.455 wanted to hear more about
NOTE Confidence: 0.9873545
01:00:32.455 --> 01:00:33.735 your thoughts about this kind
NOTE Confidence: 0.9873545
01:00:33.735 --> 01:00:34.395 of blunting,
NOTE Confidence: 0.5896852
01:00:35.895 --> 01:00:36.375 affect
NOTE Confidence: 0.97173464
01:00:36.935 --> 01:00:38.855 Yeah. Actually, very quickly,
NOTE Confidence: 0.9334232
01:00:39.575 --> 01:00:40.860 in studies that we've, you
NOTE Confidence: 0.9334232
01:00:40.940 --> 01:00:42.380 know, we began doing studies
NOTE Confidence: 0.9334232
01:00:42.380 --> 01:00:43.520 with, IBTHC
NOTE Confidence: 0.9344715
01:00:44.140 --> 01:00:46.240 about in nineteen ninety seven.
NOTE Confidence: 0.99115473
01:00:46.700 --> 01:00:48.860 And we initially started off
NOTE Confidence: 0.99115473
01:00:48.860 --> 01:00:50.060 doing work with people who
NOTE Confidence: 0.99115473
01:00:50.060 --> 01:00:51.040 are using maybe
NOTE Confidence: 0.99147934
01:00:51.580 --> 01:00:52.780 once a month, once a
NOTE Confidence: 0.99147934

01:00:52.780 --> 01:00:54.375 week. I wouldn't call them,
NOTE Confidence: 0.99147934

01:00:54.455 --> 01:00:56.055 you know, regular cannabis users.
NOTE Confidence: 0.99147934

01:00:56.055 --> 01:00:56.715 And across
NOTE Confidence: 0.9636112

01:00:57.575 --> 01:00:58.075 cognition,
NOTE Confidence: 0.99865294

01:00:58.935 --> 01:00:59.915 cognitive measures,
NOTE Confidence: 0.99797076

01:01:01.335 --> 01:01:04.235 endocrine measures, neurochemical measures, electrophysiological
NOTE Confidence: 0.98309547

01:01:04.855 --> 01:01:05.355 measures,
NOTE Confidence: 0.9807696

01:01:05.735 --> 01:01:07.015 they all had a blunted
NOTE Confidence: 0.9807696

01:01:07.015 --> 01:01:08.315 response to THC.
NOTE Confidence: 0.9983563

01:01:08.870 --> 01:01:10.470 And our interpretation of that
NOTE Confidence: 0.9983563

01:01:10.470 --> 01:01:11.450 blunted response
NOTE Confidence: 0.9771437

01:01:12.150 --> 01:01:13.110 was either they had a
NOTE Confidence: 0.9771437

01:01:13.110 --> 01:01:14.790 blunted response to begin with
NOTE Confidence: 0.9771437

01:01:14.790 --> 01:01:16.310 as there's something different about
NOTE Confidence: 0.9771437

01:01:16.310 --> 01:01:16.810 them
NOTE Confidence: 0.9248751

01:01:17.350 --> 01:01:19.110 at, the very outset or
NOTE Confidence: 0.9248751

01:01:19.110 --> 01:01:20.330 that this was a consequence
NOTE Confidence: 0.99806225

01:01:21.115 --> 01:01:22.955 of even limited exposure to
NOTE Confidence: 0.99806225

01:01:22.955 --> 01:01:24.235 cannabis. And what we do
NOTE Confidence: 0.99806225

01:01:24.235 --> 01:01:25.455 know about the endocannabinoid
NOTE Confidence: 0.9997508

01:01:25.755 --> 01:01:26.255 system
NOTE Confidence: 0.9944237

01:01:26.795 --> 01:01:28.715 is that it's it's highly
NOTE Confidence: 0.9944237

01:01:28.715 --> 01:01:31.035 dynamic and adaptive. So, you
NOTE Confidence: 0.9944237

01:01:31.035 --> 01:01:31.695 know, within
NOTE Confidence: 0.9179421

01:01:32.395 --> 01:01:34.155 few exposures, it can change.
NOTE Confidence: 0.9179421

01:01:34.155 --> 01:01:34.895 And likewise,
NOTE Confidence: 0.9717165

01:01:35.270 --> 01:01:36.890 within few days of abstaining,
NOTE Confidence: 0.9842251

01:01:37.349 --> 01:01:38.970 it can also change. So,
NOTE Confidence: 0.99769235

01:01:40.310 --> 01:01:41.930 that so that's my
NOTE Confidence: 0.9656586

01:01:42.630 --> 01:01:44.470 working hypothesis right now that
NOTE Confidence: 0.9656586

01:01:44.470 --> 01:01:46.630 even minimal exposure can result

NOTE Confidence: 0.9656586
01:01:46.630 --> 01:01:47.130 in
NOTE Confidence: 0.92570144
01:01:47.454 --> 01:01:47.855 in,
NOTE Confidence: 0.89640576
01:01:48.255 --> 01:01:49.694 in a down regulation and
NOTE Confidence: 0.89640576
01:01:49.694 --> 01:01:50.194 desensitization
NOTE Confidence: 0.99819285
01:01:50.734 --> 01:01:51.555 of the system.
NOTE Confidence: 0.9997208
01:01:52.015 --> 01:01:52.515 Mhmm.
NOTE Confidence: 0.9614137
01:01:53.375 --> 01:01:54.895 Mhmm. Yeah. I think that
NOTE Confidence: 0.9614137
01:01:54.895 --> 01:01:56.655 that tracks. I am interested
NOTE Confidence: 0.9614137
01:01:56.655 --> 01:01:57.454 in a b c d
NOTE Confidence: 0.9614137
01:01:57.454 --> 01:01:58.415 too with the very low
NOTE Confidence: 0.9614137
01:01:58.415 --> 01:01:59.615 level users because we all
NOTE Confidence: 0.9614137
01:01:59.615 --> 01:02:00.515 exclude them.
NOTE Confidence: 0.9813604
01:02:01.630 --> 01:02:02.130 Interesting.
NOTE Confidence: 0.9291491
01:02:02.510 --> 01:02:03.390 You know, I could see
NOTE Confidence: 0.9291491
01:02:03.390 --> 01:02:05.250 especially if someone has, like,
NOTE Confidence: 0.9291491

01:02:05.310 --> 01:02:05.810 perhaps
NOTE Confidence: 0.9372872

01:02:06.190 --> 01:02:07.550 little bit lowered or diminished
NOTE Confidence: 0.9372872

01:02:07.550 --> 01:02:08.830 signaling and they're using just
NOTE Confidence: 0.9372872

01:02:08.830 --> 01:02:09.570 a little bit
NOTE Confidence: 0.9824989

01:02:09.950 --> 01:02:11.390 to, like, bolster it. I
NOTE Confidence: 0.9824989

01:02:11.390 --> 01:02:12.830 could see that actually having
NOTE Confidence: 0.9824989

01:02:12.830 --> 01:02:14.109 a positive effect on some
NOTE Confidence: 0.9824989

01:02:14.109 --> 01:02:14.930 of these outcomes.
NOTE Confidence: 0.9477393

01:02:17.155 --> 01:02:18.755 Or it it could be
NOTE Confidence: 0.9477393

01:02:18.835 --> 01:02:20.115 you know, it's just it's
NOTE Confidence: 0.9477393

01:02:20.115 --> 01:02:22.035 it's also detrimental, but it
NOTE Confidence: 0.9477393

01:02:22.115 --> 01:02:23.395 to a lesser extent, you
NOTE Confidence: 0.9477393

01:02:23.395 --> 01:02:24.915 know, we know we know
NOTE Confidence: 0.9477393

01:02:24.915 --> 01:02:27.015 almost nothing about those folks.
NOTE Confidence: 0.9477393

01:02:27.235 --> 01:02:28.115 And it's a lot of
NOTE Confidence: 0.9477393

01:02:28.115 --> 01:02:29.395 them. It's millions and millions

NOTE Confidence: 0.9477393
01:02:29.395 --> 01:02:30.835 of people that is like
NOTE Confidence: 0.9477393
01:02:30.835 --> 01:02:31.680 that. That. And it's only
NOTE Confidence: 0.9477393
01:02:31.680 --> 01:02:33.200 gonna get more and more.
NOTE Confidence: 0.9477393
01:02:33.200 --> 01:02:35.040 Yeah. Yeah. Well, thank you
NOTE Confidence: 0.9477393
01:02:35.040 --> 01:02:36.080 so much. It was really
NOTE Confidence: 0.9477393
01:02:36.080 --> 01:02:36.880 nice to meet all of
NOTE Confidence: 0.9477393
01:02:36.880 --> 01:02:38.400 you. Thank thank you. And,
NOTE Confidence: 0.9477393
01:02:38.720 --> 01:02:40.020 next month, we have,
NOTE Confidence: 0.8797044
01:02:40.960 --> 01:02:42.640 Martha DeForti from the Institute
NOTE Confidence: 0.8797044
01:02:42.640 --> 01:02:43.380 of Psychiatry.
NOTE Confidence: 0.92965823
01:02:44.105 --> 01:02:45.464 And the following month, we
NOTE Confidence: 0.92965823
01:02:45.464 --> 01:02:47.224 have Ryan Vandree who's gonna
NOTE Confidence: 0.92965823
01:02:47.224 --> 01:02:49.164 be talking about delta eight
NOTE Confidence: 0.92965823
01:02:49.305 --> 01:02:50.265 THC, which,
NOTE Confidence: 0.9842008
01:02:51.065 --> 01:02:52.825 which is, also an interesting
NOTE Confidence: 0.9842008

01:02:52.825 --> 01:02:54.585 compound. So thanks, very much,

NOTE Confidence: 0.9842008

01:02:54.585 --> 01:02:56.365 Krista. We'll be in touch.

NOTE Confidence: 0.9327531

01:02:57.937 --> 01:02:59.796 Bye. Week, guys. Thank you.