WEBVTT

NOTE duration:"00:20:09.0800000"

NOTE recognizability:0.894

NOTE language:en-us

NOTE Confidence: 0.88485608

00:00:00.000 --> 00:00:02.240 I'm going to introduce our next speaker,

NOTE Confidence: 0.88485608

00:00:02.240 --> 00:00:04.150 So Doctor Murray Cirilli earned

NOTE Confidence: 0.88485608

00:00:04.150 --> 00:00:07.190 her MD and PhD from the University

NOTE Confidence: 0.88485608

00:00:07.190 --> 00:00:09.092 of Amsterdam, the Netherlands,

NOTE Confidence: 0.88485608

00:00:09.092 --> 00:00:11.648 and is an endocrinologist at the

NOTE Confidence: 0.88485608

00:00:11.648 --> 00:00:13.480 Amsterdam University Medical Center.

NOTE Confidence: 0.88485608

00:00:13.480 --> 00:00:16.920 In 2019 she became the Professor of Medicine,

NOTE Confidence: 0.88485608

00:00:16.920 --> 00:00:18.412 Nutrition and Energy Metabolism

NOTE Confidence: 0.88485608

00:00:18.412 --> 00:00:20.277 at the University of Amsterdam,

NOTE Confidence: 0.88485608

00:00:20.280 --> 00:00:23.640 and in 2023 she moved to Yale University,

NOTE Confidence: 0.88485608

00:00:23.640 --> 00:00:25.719 while she was promoted to Professor of

NOTE Confidence: 0.88485608

00:00:25.719 --> 00:00:28.039 Medicine in the section of Endocrinology.

NOTE Confidence: 0.88485608

00:00:28.040 --> 00:00:30.500 Her research interests lie in the

NOTE Confidence: 0.88485608

00:00:30.500 --> 00:00:32.351 metabolic consequences of obesity and

NOTE Confidence: 0.88485608

00:00:32.351 --> 00:00:34.839 the role of the brain in weight gain.

NOTE Confidence: 0.88485608

00:00:34.840 --> 00:00:36.280 Doctor Sohaili,

NOTE Confidence: 0.807277218888889

00:00:44.960 --> 00:00:47.045 thank you Anya and for

NOTE Confidence: 0.807277218888889

00:00:47.045 --> 00:00:48.713 organizing this great initiative.

NOTE Confidence: 0.807277218888889

00:00:48.720 --> 00:00:51.152 So I'm going to talk mostly

NOTE Confidence: 0.807277218888889

00:00:51.152 --> 00:00:54.502 data in humans and data on

NOTE Confidence: 0.807277218888889

00:00:54.502 --> 00:00:57.200 the on the human brain. So,

NOTE Confidence: 0.8079779

00:00:59.280 --> 00:01:04.440 so the the, the prevalence of of

NOTE Confidence: 0.8079779

00:01:04.440 --> 00:01:08.140 obesity really parallels the the

NOTE Confidence: 0.8079779

00:01:08.140 --> 00:01:11.440 increase in availability of food.

NOTE Confidence: 0.8079779

00:01:11.440 --> 00:01:12.700 So apparently when there's

NOTE Confidence: 0.8079779

00:01:12.700 --> 00:01:14.275 a lot of food around,

NOTE Confidence: 0.8079779

00:01:14.280 --> 00:01:18.277 people eat more than they actually need.

NOTE Confidence: 0.8079779

00:01:18.280 --> 00:01:21.213 So the question really is why do

NOTE Confidence: 0.8079779

00:01:21.213 --> 00:01:24.119 we eat beyond homeostatic need?

NOTE Confidence: 0.8079779

00:01:24.120 --> 00:01:27.708 And I think that answer mostly

NOTE Confidence: 0.8079779

00:01:27.708 --> 00:01:31.476 can be found in the brain.

NOTE Confidence: 0.8079779

00:01:31.480 --> 00:01:35.645 So to very briefly summarize the food

NOTE Confidence: 0.8079779

00:01:35.645 --> 00:01:38.224 intake regulation so that you know

NOTE Confidence: 0.8079779

00:01:38.224 --> 00:01:40.826 you understand more of what we've been

NOTE Confidence: 0.8079779

00:01:40.826 --> 00:01:43.076 doing with neuroimaging in humans,

NOTE Confidence: 0.8079779

00:01:43.080 --> 00:01:45.556 I want to just briefly guide you

NOTE Confidence: 0.8079779

00:01:45.556 --> 00:01:47.146 through this very complex regulation

NOTE Confidence: 0.8079779

00:01:47.146 --> 00:01:49.039 and this is very simplified.

NOTE Confidence: 0.8079779

00:01:49.040 --> 00:01:53.988 So there are many signals coming from

NOTE Confidence: 0.8079779

00:01:53.988 --> 00:01:57.516 the body, including the gut peptides,

NOTE Confidence: 0.8079779

00:01:57.520 --> 00:01:59.216 GOP, 1G, IPCCK, etcetera,

NOTE Confidence: 0.8079779

00:01:59.216 --> 00:02:02.368 ghrelin that inform the brain about food

NOTE Confidence: 0.8079779

00:02:02.368 --> 00:02:06.272 in the stomach and intestines or no food.

NOTE Confidence: 0.8079779

00:02:06.280 --> 00:02:09.320 But other factors like nutrients,

NOTE Confidence: 0.8079779

00:02:09.320 --> 00:02:09.791 glucose,

NOTE Confidence: 0.8079779

00:02:09.791 --> 00:02:12.146 hormones like insulin and leptin

NOTE Confidence: 0.8079779

00:02:12.146 --> 00:02:14.536 from adipose tissue also inform

NOTE Confidence: 0.8079779

00:02:14.536 --> 00:02:16.676 different areas in the brain,

NOTE Confidence: 0.8079779

00:02:16.680 --> 00:02:18.160 as you can see here.

NOTE Confidence: 0.8079779

00:02:18.160 --> 00:02:20.456 And then all these signals are put

NOTE Confidence: 0.8079779

00:02:20.456 --> 00:02:22.830 together and then that leads to a

NOTE Confidence: 0.8079779

00:02:22.830 --> 00:02:24.480 feeding or no feeding response.

NOTE Confidence: 0.966431775

00:02:27.440 --> 00:02:29.351 To make it even more simple to

NOTE Confidence: 0.966431775

00:02:29.351 --> 00:02:31.640 be able to study this in humans,

NOTE Confidence: 0.966431775

00:02:31.640 --> 00:02:35.120 we had to simplify the model even further.

NOTE Confidence: 0.966431775

00:02:35.120 --> 00:02:37.528 So we defied, and this

NOTE Confidence: 0.966431775

00:02:37.528 --> 00:02:38.895 is a little artificial,

NOTE Confidence: 0.966431775

00:02:38.895 --> 00:02:41.625 but the the food intake regulation

NOTE Confidence: 0.966431775

00:02:41.625 --> 00:02:44.378 systems in a homeostatic part and

NOTE Confidence: 0.966431775

00:02:44.378 --> 00:02:47.000 a hedonic part or reward part.

NOTE Confidence: 0.966431775

00:02:47.000 --> 00:02:49.632 Of course there's a lot of overlap

NOTE Confidence: 0.966431775

00:02:49.632 --> 00:02:52.218 between these areas and there are

NOTE Confidence: 0.966431775

00:02:52.218 --> 00:02:53.676 many neurotransmitters involved.

NOTE Confidence: 0.966431775

00:02:53.680 --> 00:02:55.505 One of the major neurotransmitters

NOTE Confidence: 0.966431775

00:02:55.505 --> 00:02:58.387 in the reward system in the brain is

NOTE Confidence: 0.966431775

00:02:58.387 --> 00:03:01.030 dopamine and one of the neurotransmitters

NOTE Confidence: 0.966431775

00:03:01.030 --> 00:03:02.878 in the homeostatic system,

NOTE Confidence: 0.966431775

00:03:02.880 --> 00:03:05.538 which lies mostly in life settlements

NOTE Confidence: 0.966431775

00:03:05.538 --> 00:03:08.440 in the brain stem is serotonin.

NOTE Confidence: 0.966431775

00:03:08.440 --> 00:03:10.474 So for the sake of time I'm just going

NOTE Confidence: 0.966431775

00:03:10.474 --> 00:03:12.709 to very briefly touch upon our findings

NOTE Confidence: 0.966431775

00:03:12.709 --> 00:03:14.398 on disturbances in the serotonin

NOTE Confidence: 0.966431775

00:03:14.398 --> 00:03:16.998 system in the brain in people with obesity.

NOTE Confidence: 0.966431775

00:03:17.000 --> 00:03:19.480 And this is by please don't read this,

NOTE Confidence: 0.966431775

00:03:19.480 --> 00:03:22.042 but this is just to show you

NOTE Confidence: 0.966431775

00:03:22.042 --> 00:03:24.198 how difficult it is to study,

NOTE Confidence: 0.966431775

00:03:24.200 --> 00:03:27.080 in this case, serotonin,

NOTE Confidence: 0.966431775

00:03:27.080 --> 00:03:28.450 serotoninergic regulation of

NOTE Confidence: 0.966431775

00:03:28.450 --> 00:03:30.075 food intake by the brain.

NOTE Confidence: 0.966431775

00:03:30.080 --> 00:03:32.304 But here you can see we just summarized

NOTE Confidence: 0.966431775

00:03:32.304 --> 00:03:34.322 all the literature showing all the

NOTE Confidence: 0.966431775

00:03:34.322 --> 00:03:36.840 brain areas and within the brain areas,

NOTE Confidence: 0.966431775

00:03:36.840 --> 00:03:39.342 the nuclei that use serotonin for

NOTE Confidence: 0.966431775

00:03:39.342 --> 00:03:41.560 signalling to modulate food intake.

NOTE Confidence: 0.966431775

00:03:41.560 --> 00:03:44.864 So you can imagine it's really hard to

NOTE Confidence: 0.966431775

00:03:44.864 --> 00:03:47.674 study and therefore we need all the the,

NOTE Confidence: 0.966431775

00:03:47.680 --> 00:03:49.004 the, the animal data.

NOTE Confidence: 0.966431775

00:03:49.004 --> 00:03:51.789 So this is just to summarize what we've

NOTE Confidence: 0.966431775

00:03:51.789 --> 00:03:53.740 been seeing in the serotonergic system.

NOTE Confidence: 0.966431775

00:03:53.740 --> 00:03:56.000 And this is small, but it doesn't matter,

NOTE Confidence: 0.966431775

00:03:56.000 --> 00:03:57.040 it's just one slide.

NOTE Confidence: 0.966431775

00:03:57.040 --> 00:03:59.910 So when we looked at postmortem hypothalamic

NOTE Confidence: 0.966431775

00:03:59.910 --> 00:04:02.267 tissue in people with a healthy

NOTE Confidence: 0.966431775

00:04:02.267 --> 00:04:04.717 weight and people with ABMI above 25,

NOTE Confidence: 0.966431775

00:04:04.720 --> 00:04:07.440 we found lower expression

NOTE Confidence: 0.966431775

00:04:07.440 --> 00:04:09.480 of serotonin transporters.

NOTE Confidence: 0.966431775

00:04:09.480 --> 00:04:11.892 And to verify that this was

NOTE Confidence: 0.966431775

00:04:11.892 --> 00:04:14.240 not a just postmortem finding,

NOTE Confidence: 0.966431775

00:04:14.240 --> 00:04:16.088 we also validate this with a

NOTE Confidence: 0.966431775

00:04:16.088 --> 00:04:18.834 SPECT scan in vivo where we found

NOTE Confidence: 0.966431775

00:04:18.834 --> 00:04:20.277 lower hypothalamic serotonin,

NOTE Confidence: 0.966431775

00:04:20.280 --> 00:04:22.173 serotonin transporter binding

NOTE Confidence: 0.966431775

00:04:22.173 --> 00:04:25.959 in people with BMI over 30.

NOTE Confidence: 0.966431775

00:04:25.960 --> 00:04:29.232 We also studied the the the response of

NOTE Confidence: 0.966431775

00:04:29.232 --> 00:04:32.002 the search energic system during fasting.

NOTE Confidence: 0.966431775

00:04:32.002 --> 00:04:34.168 So people were either fasting 12

NOTE Confidence: 0.966431775

00:04:34.168 --> 00:04:37.646 or 24 hours and then we measured

NOTE Confidence: 0.966431775

00:04:37.646 --> 00:04:39.254 hypothalamic serotonin transporter

NOTE Confidence: 0.966431775

00:04:39.254 --> 00:04:41.400 availability using the SPECT scan.

NOTE Confidence: 0.966431775

00:04:41.400 --> 00:04:43.360 And we found that in people with a

NOTE Confidence: 0.966431775

00:04:43.360 --> 00:04:45.103 healthy weight there was an increase

NOTE Confidence: 0.966431775

00:04:45.103 --> 00:04:46.903 in serotonin transporters and this was

NOTE Confidence: 0.966431775

00:04:46.958 --> 00:04:48.757 not the case in people with obesity.

NOTE Confidence: 0.966431775

00:04:48.760 --> 00:04:51.010 So apparently the fasting response

NOTE Confidence: 0.966431775

00:04:51.010 --> 00:04:53.260 in terms of certainergic fasting

NOTE Confidence: 0.966431775

00:04:53.330 --> 00:04:56.011 response in the brain is different in

NOTE Confidence: 0.966431775

00:04:56.011 --> 00:04:58.876 people with obesity and this might be

NOTE Confidence: 0.966431775

00:04:58.876 --> 00:05:01.021 related to differences in circulating

NOTE Confidence: 0.966431775

00:05:01.021 --> 00:05:03.838 factors like free fatty acids and insulin.

NOTE Confidence: 0.966431775

00:05:03.840 --> 00:05:06.216 And finally we also did a study where

NOTE Confidence: 0.966431775

00:05:06.216 --> 00:05:08.373 we did an overfeeding study where

NOTE Confidence: 0.966431775

00:05:08.373 --> 00:05:11.080 we fed people with a healthy weight

NOTE Confidence: 0.966431775

00:05:11.080 --> 00:05:14.110 snacks in between meals and they

NOTE Confidence: 0.966431775

00:05:14.110 --> 00:05:17.672 gained like 5 or 6 kilos and they

NOTE Confidence: 0.966431775

00:05:17.672 --> 00:05:20.164 were totally fit leaned man in this

NOTE Confidence: 0.966431775

00:05:20.164 --> 00:05:22.746 case and we were able to replicate

NOTE Confidence: 0.966431775

00:05:22.746 --> 00:05:25.240 the findings in people with obesity.

NOTE Confidence: 0.966431775

00:05:25.240 --> 00:05:27.767 So we think that overfeeding leads to

NOTE Confidence: 0.966431775

00:05:27.767 --> 00:05:29.997 a decrease in serotonin transporters

NOTE Confidence: 0.966431775

00:05:29.997 --> 00:05:32.687 and serotonin signalling and that

NOTE Confidence: 0.966431775

00:05:32.687 --> 00:05:36.340 might contribute to overeating and

NOTE Confidence: 0.966431775

00:05:36.340 --> 00:05:40.960 obesity but moving on to to dopamine.

NOTE Confidence: 0.934251430909091

00:05:43.600 --> 00:05:45.232 So dopamine is a really the

NOTE Confidence: 0.934251430909091

00:05:45.232 --> 00:05:46.640 whole dopamine system is very,

NOTE Confidence: 0.934251430909091

00:05:46.640 --> 00:05:50.160 very important in reward learning,

NOTE Confidence: 0.934251430909091

00:05:50.160 --> 00:05:53.538 reward processing and hedonic part and

NOTE Confidence: 0.934251430909091

00:05:53.538 --> 00:05:56.960 the motivational part of food intake.

NOTE Confidence: 0.934251430909091

00:05:56.960 --> 00:06:00.200 So we are able to image dopamine receptor

NOTE Confidence: 0.934251430909091

00:06:00.200 --> 00:06:03.164 bind or receptors by using a radio

NOTE Confidence: 0.934251430909091

00:06:03.164 --> 00:06:06.479 tracer and in this case we used SPECT.

NOTE Confidence: 0.934251430909091

00:06:06.480 --> 00:06:08.255 In the future we're probably

NOTE Confidence: 0.934251430909091

00:06:08.255 --> 00:06:09.675 together with nuclear medicine.

NOTE Confidence: 0.934251430909091

00:06:09.680 --> 00:06:11.528 We will use PET scan because

NOTE Confidence: 0.934251430909091

00:06:11.528 --> 00:06:13.680 it has a better sensitivity.

NOTE Confidence: 0.934251430909091

00:06:13.680 --> 00:06:14.760 But in any case,

NOTE Confidence: 0.934251430909091

00:06:14.760 --> 00:06:16.920 we found that in people with obesity,

NOTE Confidence: 0.934251430909091

00:06:16.920 --> 00:06:18.840 these were all women,

NOTE Confidence: 0.934251430909091

00:06:18.840 --> 00:06:21.720 but there were lower dopamine receptor,

NOTE Confidence: 0.934251430909091

00:06:21.720 --> 00:06:24.317 there was a lower dopamine receptor binding.

NOTE Confidence: 0.934251430909091

00:06:24.320 --> 00:06:26.196 We don't know at this point whether

NOTE Confidence: 0.934251430909091

00:06:26.196 --> 00:06:28.710 there was a lower dopamine receptor

NOTE Confidence: 0.934251430909091

00:06:28.710 --> 00:06:31.560 expression or more dopamine release.

NOTE Confidence: 0.934251430909091

00:06:31.560 --> 00:06:32.640 But in any case,

NOTE Confidence: 0.934251430909091

00:06:32.640 --> 00:06:33.990 we found lower dopamine receptor

NOTE Confidence: 0.934251430909091

00:06:33.990 --> 00:06:35.398 binding in people with obesity.

NOTE Confidence: 0.934251430909091

00:06:35.400 --> 00:06:37.080 So there seems to be something

NOTE Confidence: 0.934251430909091

00:06:37.080 --> 00:06:38.640 wrong in the dopamine system.

NOTE Confidence: 0.934251430909091

00:06:38.640 --> 00:06:40.728 So we were wondering is this

NOTE Confidence: 0.934251430909091

00:06:40.728 --> 00:06:42.120 reversed by weight loss?

NOTE Confidence: 0.934251430909091

00:06:42.120 --> 00:06:45.879 So the same women with obesity underwent

NOTE Confidence: 0.934251430909091

00:06:45.879 --> 00:06:48.420 beartic surgery and six weeks after

NOTE Confidence: 0.934251430909091

00:06:48.420 --> 00:06:50.245 Bretic surgery where they already

NOTE Confidence: 0.934251430909091

00:06:50.245 --> 00:06:52.257 were in a negative energy balance

NOTE Confidence: 0.934251430909091

00:06:52.257 --> 00:06:54.719 for a couple of weeks or six weeks.

NOTE Confidence: 0.934251430909091

00:06:54.720 --> 00:06:56.640 We found no reversibility,

NOTE Confidence: 0.934251430909091

00:06:56.640 --> 00:06:59.520 so there was no increase in

NOTE Confidence: 0.934251430909091

00:06:59.609 --> 00:07:01.919 dopamine receptor binding.

NOTE Confidence: 0.934251430909091

00:07:01.920 --> 00:07:03.586 We then studied them again about a

NOTE Confidence: 0.934251430909091

00:07:03.586 --> 00:07:05.699 year and a half or two years after

NOTE Confidence: 0.934251430909091

00:07:05.699 --> 00:07:07.707 bretic surgery and there we found that

NOTE Confidence: 0.934251430909091

00:07:07.707 --> 00:07:09.513 there was a slight but significant

NOTE Confidence: 0.934251430909091

00:07:09.513 --> 00:07:11.359 increase in dopamine receptor binding.

NOTE Confidence: 0.934251430909091

00:07:11.359 --> 00:07:15.080 So we think it might be partially reversible.

NOTE Confidence: 0.934251430909091

00:07:15.080 --> 00:07:17.960 It was still lower as you can see

NOTE Confidence: 0.934251430909091

00:07:17.960 --> 00:07:19.880 here compared to the lean controls,

NOTE Confidence: 0.934251430909091

00:07:19.880 --> 00:07:21.998 but BMI was also still higher.

NOTE Confidence: 0.934251430909091

00:07:22.000 --> 00:07:23.600 But having said that,

NOTE Confidence: 0.934251430909091

00:07:23.600 --> 00:07:25.200 we of course correlated,

NOTE Confidence: 0.934251430909091

00:07:25.200 --> 00:07:27.069 We wanted to know what are the

NOTE Confidence: 0.934251430909091

00:07:27.069 --> 00:07:29.122 determinants of an increase in dopamine

NOTE Confidence: 0.934251430909091

00:07:29.122 --> 00:07:30.912 receptor binding in these women.

NOTE Confidence: 0.934251430909091

00:07:30.912 --> 00:07:32.652 And this was not correlated

NOTE Confidence: 0.934251430909091

00:07:32.652 --> 00:07:34.357 to the decrease in BMI.

NOTE Confidence: 0.973856064

00:07:36.400 --> 00:07:40.130 And actually when we put data together

NOTE Confidence: 0.973856064

00:07:40.130 --> 00:07:43.155 from published trials in humans,

NOTE Confidence: 0.973856064

00:07:43.160 --> 00:07:46.233 we found that indeed there is no

NOTE Confidence: 0.973856064

00:07:46.233 --> 00:07:48.137 linear correlation between BMI

NOTE Confidence: 0.973856064

00:07:48.137 --> 00:07:50.177 and dopamine receptor binding

NOTE Confidence: 0.973856064

00:07:50.177 --> 00:07:51.790 using patents, SPECT scans.

NOTE Confidence: 0.973856064

00:07:51.790 --> 00:07:54.150 And it seems to be that there first

NOTE Confidence: 0.973856064

00:07:54.219 --> 00:07:56.557 is an increase followed by a decrease.

NOTE Confidence: 0.973856064

00:07:56.560 --> 00:07:58.448 And this is also what we found in

NOTE Confidence: 0.973856064

00:07:58.448 --> 00:07:59.440 our own studies.

NOTE Confidence: 0.973856064

00:07:59.440 --> 00:08:00.680 This is still unpublished.

NOTE Confidence: 0.911124308

00:08:03.280 --> 00:08:05.470 So we were thinking what other

NOTE Confidence: 0.911124308

00:08:05.470 --> 00:08:07.356 determinants then of lower dopamine

NOTE Confidence: 0.911124308

00:08:07.356 --> 00:08:09.474 receptor binding and we think part

NOTE Confidence: 0.911124308

00:08:09.474 --> 00:08:12.085 of it might be explained by eating

NOTE Confidence: 0.911124308

00:08:12.085 --> 00:08:14.317 patterns and timing of food intake.

NOTE Confidence: 0.911124308

00:08:14.320 --> 00:08:15.336 And as you know,

NOTE Confidence: 0.911124308

00:08:15.336 --> 00:08:18.000 a lot of people get a lot of calories,

NOTE Confidence: 0.911124308

00:08:18.000 --> 00:08:20.320 their daily calories from snacking.

NOTE Confidence: 0.929683228571428

00:08:23.040 --> 00:08:24.636 So there was a very elegant study.

NOTE Confidence: 0.929683228571428

00:08:24.640 --> 00:08:27.106 As you know, there is a lot of interest

NOTE Confidence: 0.929683228571428

00:08:27.106 --> 00:08:29.275 in intermittent fasting and time

NOTE Confidence: 0.929683228571428

00:08:29.275 --> 00:08:31.560 restricted eating to lose weight.

NOTE Confidence: 0.929683228571428

00:08:31.560 --> 00:08:33.443 And this is a very nice study

NOTE Confidence: 0.929683228571428

00:08:33.443 --> 00:08:35.296 where they looked at total energy

NOTE Confidence: 0.929683228571428

00:08:35.296 --> 00:08:36.931 expenditure in people that would

NOTE Confidence: 0.929683228571428

00:08:36.931 --> 00:08:39.020 eat most of their calories in the

NOTE Confidence: 0.929683228571428

00:08:39.020 --> 00:08:42.152 morning or later in the day during a

NOTE Confidence: 0.929683228571428

00:08:42.152 --> 00:08:45.112 hypocaloric diet and they found no

NOTE Confidence: 0.929683228571428

00:08:45.112 --> 00:08:47.352 difference in total energy expenditure.

NOTE Confidence: 0.929683228571428

00:08:47.360 --> 00:08:50.078 But what they did find is that there was,

NOTE Confidence: 0.929683228571428

00:08:50.080 --> 00:08:52.195 there were reduced feelings of

NOTE Confidence: 0.929683228571428

00:08:52.195 --> 00:08:55.179 hunger in the people that ate most

NOTE Confidence: 0.929683228571428

00:08:55.179 --> 00:08:57.555 of their calories in the morning.

NOTE Confidence: 0.929683228571428

00:08:57.560 --> 00:09:01.513 And that fits really nicely with a study

NOTE Confidence: 0.929683228571428

00:09:01.513 --> 00:09:06.200 that we did earlier in Man with Obesity

NOTE Confidence: 0.929683228571428

00:09:06.200 --> 00:09:10.080 that we put on a timed hypocaloric diet.

NOTE Confidence: 0.929683228571428

00:09:10.080 --> 00:09:13.030 And So what we did is they got a pretty

NOTE Confidence: 0.929683228571428

00:09:13.105 --> 00:09:15.463 strict I have to say hypocaloric

NOTE Confidence: 0.929683228571428

00:09:15.463 --> 00:09:18.077 diet and they would eat most of

NOTE Confidence: 0.929683228571428

00:09:18.077 --> 00:09:20.602 their most of their calories in the

NOTE Confidence: 0.929683228571428

00:09:20.602 --> 00:09:23.557 morning or in the OR in the evening.

NOTE Confidence: 0.929683228571428

00:09:23.560 --> 00:09:25.426 And while the calories at lunch

NOTE Confidence: 0.929683228571428

00:09:25.426 --> 00:09:26.359 were the same,

NOTE Confidence: 0.929683228571428

00:09:26.360 --> 00:09:29.123 So first we looked at so the per study

NOTE Confidence: 0.929683228571428

00:09:29.123 --> 00:09:31.958 design they lost the same amount of weight.

NOTE Confidence: 0.929683228571428

00:09:31.960 --> 00:09:33.796 And 1st we looked at metabolic

NOTE Confidence: 0.929683228571428

00:09:33.796 --> 00:09:35.740 outcomes and it really didn't matter

NOTE Confidence: 0.929683228571428

00:09:35.740 --> 00:09:38.043 whether they would eat most of the

NOTE Confidence: 0.929683228571428

00:09:38.043 --> 00:09:39.880 calories in the morning or evening

NOTE Confidence: 0.929683228571428

00:09:39.880 --> 00:09:42.400 in terms of improvement in insulin

NOTE Confidence: 0.929683228571428

00:09:42.400 --> 00:09:45.078 sensitivity in the liver or in muscle.

NOTE Confidence: 0.929683228571428

00:09:45.080 --> 00:09:48.666 And also liver fat was was really

NOTE Confidence: 0.929683228571428

00:09:48.666 --> 00:09:50.318 decreased in both conditions.

NOTE Confidence: 0.929683228571428

00:09:50.320 --> 00:09:52.280 But when we then looked at the

NOTE Confidence: 0.929683228571428

00:09:52.280 --> 00:09:54.199 brain there were some differences.

NOTE Confidence: 0.929683228571428

00:09:54.200 --> 00:09:57.602 So the man that ate most of the calories

NOTE Confidence: 0.929683228571428

00:09:57.602 --> 00:10:01.614 in the morning during weight loss had an

NOTE Confidence: 0.929683228571428

00:10:01.614 --> 00:10:05.920 increase an increase dopamine transporters.

NOTE Confidence: 0.929683228571428

00:10:05.920 --> 00:10:06.407 Sorry,

NOTE Confidence: 0.929683228571428

00:10:06.407 --> 00:10:08.355 a dopamine transporter availability

NOTE Confidence: 0.929683228571428

00:10:08.355 --> 00:10:11.274 in the street and using SPECT

NOTE Confidence: 0.929683228571428

00:10:11.274 --> 00:10:12.586 scans while the people,

NOTE Confidence: 0.929683228571428

00:10:12.586 --> 00:10:14.700 the man in the dinner group that

NOTE Confidence: 0.929683228571428

00:10:14.764 --> 00:10:16.878 ate most of the calories at dinner,

NOTE Confidence: 0.929683228571428

00:10:16.880 --> 00:10:20.114 they they had a decrease and this

NOTE Confidence: 0.929683228571428

00:10:20.114 --> 00:10:22.520 differential response was significant.

NOTE Confidence: 0.929683228571428

00:10:22.520 --> 00:10:23.262 So there.

NOTE Confidence: 0.929683228571428

00:10:23.262 --> 00:10:25.488 So timing of food intake seems

NOTE Confidence: 0.929683228571428

00:10:25.488 --> 00:10:27.798 to affect the dopamine system.

NOTE Confidence: 0.929683228571428

00:10:27.800 --> 00:10:28.462 And also,

NOTE Confidence: 0.929683228571428

00:10:28.462 --> 00:10:30.117 and this is still unpublished,

NOTE Confidence: 0.929683228571428

00:10:30.120 --> 00:10:31.944 when we put them in the in the

NOTE Confidence: 0.929683228571428

00:10:31.944 --> 00:10:33.853 MRI and scanned them and showed

NOTE Confidence: 0.929683228571428

00:10:33.853 --> 00:10:35.237 them pictures of food,

NOTE Confidence: 0.929683228571428

00:10:35.240 --> 00:10:37.081 we found that the man that ate

NOTE Confidence: 0.929683228571428

00:10:37.081 --> 00:10:38.949 most of the calories that during

NOTE Confidence: 0.929683228571428

00:10:38.949 --> 00:10:41.315 or later during the day at dinner

NOTE Confidence: 0.929683228571428

00:10:41.320 --> 00:10:43.440 that they reacted more strongly

NOTE Confidence: 0.929683228571428

00:10:43.440 --> 00:10:46.000 to high caloric visual food cues.

NOTE Confidence: 0.929683228571428

00:10:46.000 --> 00:10:48.072 And we do know that that reaction

NOTE Confidence: 0.929683228571428

00:10:48.072 --> 00:10:49.280 really predicts weight gain,

NOTE Confidence: 0.929683228571428

00:10:49.280 --> 00:10:52.080 it predicts the ability to lose weight

NOTE Confidence: 0.929683228571428

00:10:52.080 --> 00:10:53.796 and it also predicts food intake.

NOTE Confidence: 0.950157255

00:10:56.920 --> 00:10:59.080 So timing of food intake matters.

NOTE Confidence: 0.950157255

00:10:59.080 --> 00:11:02.531 So we were also interested in in

NOTE Confidence: 0.950157255

00:11:02.531 --> 00:11:05.200 nutrient sensing and so how does the

NOTE Confidence: 0.950157255

00:11:05.200 --> 00:11:07.880 brain know that there is food around?

NOTE Confidence: 0.950157255

00:11:07.880 --> 00:11:09.900 Well, that's by tasting and

NOTE Confidence: 0.950157255

00:11:09.900 --> 00:11:11.516 smelling and seeing food.

NOTE Confidence: 0.950157255

00:11:11.520 --> 00:11:13.506 But there is also an interaction

NOTE Confidence: 0.950157255

00:11:13.506 --> 00:11:15.820 between nutrients in the gut or the gut

NOTE Confidence: 0.950157255

00:11:15.820 --> 00:11:17.870 and the brain and the communication

NOTE Confidence: 0.950157255

00:11:17.870 --> 00:11:20.120 goes through a vagal efferents,

NOTE Confidence: 0.950157255

00:11:20.120 --> 00:11:24.280 through gut hormones and serotonin

NOTE Confidence: 0.950157255

00:11:24.280 --> 00:11:26.730 and of course also circulating

NOTE Confidence: 0.950157255

00:11:26.730 --> 00:11:28.200 nutrients and hormones.

NOTE Confidence: 0.950157255

00:11:28.200 --> 00:11:29.360 So we wanted to study,

NOTE Confidence: 0.950157255

00:11:29.360 --> 00:11:31.394 is there something wrong in this

NOTE Confidence: 0.950157255

00:11:31.394 --> 00:11:33.101 communication between the gut and

NOTE Confidence: 0.950157255

00:11:33.101 --> 00:11:34.835 the brain in people with obesity.

NOTE Confidence: 0.911892998571429

00:11:37.880 --> 00:11:41.352 So what we did, we infused directly into

NOTE Confidence: 0.911892998571429

00:11:41.352 --> 00:11:44.398 the stomach using a nasogastric tube,

NOTE Confidence: 0.911892998571429

00:11:44.400 --> 00:11:47.085 either glucose or lipid or

NOTE Confidence: 0.911892998571429

00:11:47.085 --> 00:11:49.233 water control over volume.

NOTE Confidence: 0.911892998571429

00:11:49.240 --> 00:11:51.328 And it was the same in

NOTE Confidence: 0.911892998571429

00:11:51.328 --> 00:11:52.720 in volume and calories,

NOTE Confidence: 0.911892998571429

00:11:52.720 --> 00:11:54.838 in people with a healthy weight

NOTE Confidence: 0.911892998571429

00:11:54.838 --> 00:11:57.240 and also in people with obesity.

NOTE Confidence: 0.911892998571429

00:11:57.240 --> 00:12:00.320 And then we did Mris and SPECT scans,

NOTE Confidence: 0.911892998571429

00:12:00.320 --> 00:12:02.372 and the people with obesity then

NOTE Confidence: 0.911892998571429

00:12:02.372 --> 00:12:04.480 underwent A hypocaloric diet intervention

NOTE Confidence: 0.911892998571429

00:12:04.480 --> 00:12:07.637 and they lost 10% in 12 weeks.

NOTE Confidence: 0.911892998571429

00:12:07.640 --> 00:12:08.960 And then we rescanned them.

NOTE Confidence: 0.936976422222222

00:12:11.000 --> 00:12:13.439 So this is just to show you this is,

NOTE Confidence: 0.936976422222222

00:12:13.440 --> 00:12:16.513 this is the scan after the intragastric

NOTE Confidence: 0.936976422222222

00:12:16.513 --> 00:12:19.120 infusion of either lipid or glucose

NOTE Confidence: 0.936976422222222

00:12:19.120 --> 00:12:20.356 in people with a healthy weight.

NOTE Confidence: 0.936976422222222

00:12:20.360 --> 00:12:23.502 So there were so glucose gave more

NOTE Confidence: 0.936976422222222

00:12:23.502 --> 00:12:25.357 like immediate effect to lipid.

NOTE Confidence: 0.936976422222222

00:12:25.360 --> 00:12:26.364 It took a while,

NOTE Confidence: 0.936976422222222

00:12:26.364 --> 00:12:28.240 but we saw a decrease in many,

NOTE Confidence: 0.936976422222222

00:12:28.240 --> 00:12:29.665 many brain regions,

NOTE Confidence: 0.936976422222222

00:12:29.665 --> 00:12:32.040 a decrease in brain activity,

NOTE Confidence: 0.936976422222222

00:12:32.040 --> 00:12:34.820 and those included striatal

NOTE Confidence: 0.936976422222222

00:12:34.820 --> 00:12:37.600 structures and limbic structures.

NOTE Confidence: 0.936976422222222

00:12:37.600 --> 00:12:40.776 So you could say this is the physiological

NOTE Confidence: 0.936976422222222

00:12:40.776 --> 00:12:43.120 response to food in the stomach.

NOTE Confidence: 0.936976422222222

00:12:43.120 --> 00:12:45.080 When we did the same,

NOTE Confidence: 0.936976422222222

00:12:45.080 --> 00:12:47.228 this whole brain analysis,

NOTE Confidence: 0.936976422222222

00:12:47.228 --> 00:12:49.913 we found no effects whatsoever

NOTE Confidence: 0.936976422222222

00:12:49.920 --> 00:12:52.520 measurable in people with obesity.

NOTE Confidence: 0.936976422222222

00:12:52.520 --> 00:12:55.964 So somehow the brain doesn't sense that

NOTE Confidence: 0.936976422222222

00:12:55.964 --> 00:12:58.680 there's 500 kilocalories in the stomach.

NOTE Confidence: 0.936976422222222

00:12:58.680 --> 00:13:00.920 When we then zoomed in on specific regions,

NOTE Confidence: 0.936976422222222

00:13:00.920 --> 00:13:02.600 doing a region of interest analysis,

NOTE Confidence: 0.936976422222222

00:13:02.600 --> 00:13:05.280 we found that in glucose and lipid condition,

NOTE Confidence: 0.936976422222222

00:13:05.280 --> 00:13:07.404 there was a decrease in brain

NOTE Confidence: 0.936976422222222

00:13:07.404 --> 00:13:08.948 activity in the nucleus accumbens,

NOTE Confidence: 0.936976422222222

00:13:08.948 --> 00:13:10.433 which is the ventral striatum,

NOTE Confidence: 0.936976422222222

00:13:10.440 --> 00:13:12.500 which is really really important

NOTE Confidence: 0.936976422222222

00:13:12.500 --> 00:13:14.560 for reward and reward learning.

NOTE Confidence: 0.936976422222222

00:13:14.560 --> 00:13:19.297 And this this decrease in in activity makes

NOTE Confidence: 0.936976422222222

00:13:19.297 --> 00:13:21.353 sense because if there's food in the stomach,

NOTE Confidence: 0.936976422222222

00:13:21.360 --> 00:13:22.848 there's no need to go and

NOTE Confidence: 0.936976422222222

00:13:22.848 --> 00:13:23.840 search for more food,

NOTE Confidence: 0.936976422222222

00:13:23.840 --> 00:13:25.285 there's no need to be

NOTE Confidence: 0.936976422222222

00:13:25.285 --> 00:13:27.120 motivated to go and eat food.

NOTE Confidence: 0.936976422222222

00:13:27.120 --> 00:13:27.878 But this,

NOTE Confidence: 0.936976422222222

00:13:27.878 --> 00:13:30.531 this reaction was not present in people

NOTE Confidence: 0.936976422222222

00:13:30.531 --> 00:13:33.419 with obesity and and more importantly

NOTE Confidence: 0.936976422222222

00:13:33.419 --> 00:13:36.737 this didn't change after these people

NOTE Confidence: 0.936976422222222

00:13:36.737 --> 00:13:40.480 with obesity lost 10% of their body weight.

NOTE Confidence: 0.936976422222222

00:13:40.480 --> 00:13:44.040 This was the same in the dorsal stratum.

NOTE Confidence: 0.936976422222222

00:13:44.040 --> 00:13:44.776 Then we looked at,

NOTE Confidence: 0.936976422222222

00:13:44.776 --> 00:13:44.960 OK,

NOTE Confidence: 0.936976422222222

00:13:44.960 --> 00:13:46.112 what are the determinants?

NOTE Confidence: 0.936976422222222

00:13:46.112 --> 00:13:48.256 And of course we think it's it's

NOTE Confidence: 0.936976422222222

00:13:48.256 --> 00:13:49.920 it's got brain communication,

NOTE Confidence: 0.936976422222222

00:13:49.920 --> 00:13:53.070 something we cannot easily measure in

NOTE Confidence: 0.936976422222222

00:13:53.070 --> 00:13:55.920 people but we can of course in rotor models.

NOTE Confidence: 0.936976422222222

00:13:55.920 --> 00:13:59.551 But we found that GOP one seems to predict

NOTE Confidence: 0.936976422222222

00:13:59.551 --> 00:14:02.999 some of the response in the dorsal stratum.

NOTE Confidence: 0.936976422222222

00:14:03.000 --> 00:14:06.540 So lipid sensing might need GOP

NOTE Confidence: 0.936976422222222

00:14:06.540 --> 00:14:07.720 one signalling.

NOTE Confidence: 0.936976422222222

00:14:07.720 --> 00:14:11.473 I'm going to go over this because of time.

NOTE Confidence: 0.936976422222222

00:14:11.480 --> 00:14:13.640 We also looked at functional connectivity.

NOTE Confidence: 0.936976422222222

00:14:13.640 --> 00:14:15.900 Now functional connectivity really is

NOTE Confidence: 0.936976422222222

00:14:15.900 --> 00:14:19.119 looking at brain areas that change in

NOTE Confidence: 0.936976422222222

00:14:19.119 --> 00:14:21.252 synchrony and we think if they change

NOTE Confidence: 0.936976422222222

00:14:21.252 --> 00:14:23.262 in synchrony that they directly or

NOTE Confidence: 0.936976422222222

00:14:23.262 --> 00:14:25.317 indirectly communicate with each other.

NOTE Confidence: 0.936976422222222

00:14:25.320 --> 00:14:28.316 So this is more brain network response

NOTE Confidence: 0.936976422222222

00:14:28.316 --> 00:14:30.132 to intragastric nutrients and overall

NOTE Confidence: 0.936976422222222

00:14:30.132 --> 00:14:31.994 and we're still working on these data.

NOTE Confidence: 0.936976422222222

00:14:32.000 --> 00:14:34.569 We found that lipid had most effects

NOTE Confidence: 0.936976422222222

00:14:34.569 --> 00:14:36.090 on functional connectivity between

NOTE Confidence: 0.936976422222222

00:14:36.090 --> 00:14:38.238 the accumbens and some brain areas.

NOTE Confidence: 0.936976422222222

00:14:38.240 --> 00:14:41.194 Areas well glucose had more effect on

NOTE Confidence: 0.936976422222222

00:14:41.194 --> 00:14:42.871 functional connectivity between the

NOTE Confidence: 0.936976422222222

00:14:42.871 --> 00:14:44.917 dorsal stratum and and other areas.

NOTE Confidence: 0.936976422222222

00:14:44.920 --> 00:14:47.620 Interestingly also areas involved

NOTE Confidence: 0.936976422222222

00:14:47.620 --> 00:14:50.621 in memory and cognition functional

NOTE Confidence: 0.936976422222222

00:14:50.621 --> 00:14:52.126 connectivity in people with obesity

NOTE Confidence: 0.936976422222222

00:14:52.126 --> 00:14:53.960 did not show any differences.

NOTE Confidence: 0.8037825235

00:14:56.440 --> 00:14:58.360 We measured dopamine release using

NOTE Confidence: 0.8037825235

00:14:58.360 --> 00:15:00.719 SPECT and while glucose was still

NOTE Confidence: 0.8037825235

00:15:00.719 --> 00:15:02.981 able to elicit dopamine release in

NOTE Confidence: 0.8037825235

00:15:02.981 --> 00:15:05.176 people with obesity, lipid was not.

NOTE Confidence: 0.8037825235

00:15:05.176 --> 00:15:08.360 So there seems to be a reduced dopamine

NOTE Confidence: 0.8037825235

00:15:08.360 --> 00:15:12.154 response upon lipid infusion and this

NOTE Confidence: 0.8037825235

00:15:12.154 --> 00:15:15.430 this really lines up with with animal

NOTE Confidence: 0.8037825235

00:15:15.430 --> 00:15:18.400 data that was published years ago.

NOTE Confidence: 0.8037825235

00:15:18.400 --> 00:15:21.360 So why do we eat beyond homeostatic need?

NOTE Confidence: 0.8037825235

00:15:21.360 --> 00:15:24.272 I think we have shown in humans using

NOTE Confidence: 0.8037825235

00:15:24.272 --> 00:15:25.976 neuroimaging that there are disrupted

NOTE Confidence: 0.8037825235

00:15:25.976 --> 00:15:28.360 dopamine and serotonin systems in the brain,

NOTE Confidence: 0.8037825235

00:15:28.360 --> 00:15:29.960 that there is impaired nutrient

NOTE Confidence: 0.8037825235

00:15:29.960 --> 00:15:32.018 sensing and obesity, which is not

NOTE Confidence: 0.8037825235

00:15:32.018 --> 00:15:34.152 reversible after 10% weight loss.

NOTE Confidence: 0.8037825235

00:15:34.152 --> 00:15:37.248 And this might account also for

NOTE Confidence: 0.8037825235

00:15:37.248 --> 00:15:39.044 regaining weight even after

NOTE Confidence: 0.8037825235

00:15:39.044 --> 00:15:40.954 treatment with GOP one agonists.

NOTE Confidence: 0.8037825235

00:15:40.960 --> 00:15:43.571 So maybe we're not restoring food intake

NOTE Confidence: 0.8037825235

00:15:43.571 --> 00:15:45.840 regulation and the last two minutes,

NOTE Confidence: 0.8037825235

00:15:45.840 --> 00:15:48.255 if I may, it's just that my

NOTE Confidence: 0.8037825235

00:15:48.255 --> 00:15:50.400 interest is also a metabolism.

NOTE Confidence: 0.8037825235

00:15:50.400 --> 00:15:52.672 So we are also interested in how the

NOTE Confidence: 0.8037825235

00:15:52.672 --> 00:15:55.120 brain regulates glucose metabolism

NOTE Confidence: 0.8037825235

00:15:55.120 --> 00:15:58.124 and besides dopamine having a huge

NOTE Confidence: 0.8037825235

00:15:58.124 --> 00:16:00.079 role in food intake regulation,

NOTE Confidence: 0.8037825235

00:16:00.080 --> 00:16:04.290 we also were able to show that that dopamine

NOTE Confidence: 0.8037825235

00:16:04.290 --> 00:16:07.320 is able to modulate insulin sensitivity.

NOTE Confidence: 0.8037825235

00:16:07.320 --> 00:16:10.368 When we increase dopamine in people in this

NOTE Confidence: 0.8037825235

00:16:10.368 --> 00:16:13.717 case they had deep brain stimulation for OCD,

NOTE Confidence: 0.8037825235

00:16:13.720 --> 00:16:16.096 so obsessive compulsive disorder

NOTE Confidence: 0.8037825235

00:16:16.096 --> 00:16:18.729 in an area near the striatum.

NOTE Confidence: 0.8037825235

00:16:18.729 --> 00:16:20.710 And we know that when we turn

NOTE Confidence: 0.8037825235

00:16:20.770 --> 00:16:22.480 the stimulator on there is a,

NOTE Confidence: 0.8037825235

00:16:22.480 --> 00:16:24.000 there is dopamine release.

NOTE Confidence: 0.8037825235

00:16:24.000 --> 00:16:25.520 So we studied these,

NOTE Confidence: 0.8037825235

00:16:25.520 --> 00:16:29.452 these patients with the with the

NOTE Confidence: 0.8037825235

00:16:29.452 --> 00:16:32.220 stimulator on or off and what we found

NOTE Confidence: 0.8037825235

00:16:32.298 --> 00:16:35.612 is that when we turned the DBS on,

NOTE Confidence: 0.8037825235

00:16:35.612 --> 00:16:37.868 there was an improvement

NOTE Confidence: 0.8037825235

00:16:37.868 --> 00:16:39.560 in insulin sensitivity.

NOTE Confidence: 0.8037825235

00:16:39.560 --> 00:16:40.552 We were also thinking,

NOTE Confidence: 0.8037825235

00:16:40.552 --> 00:16:41.673 OK, if it's dopamine,

NOTE Confidence: 0.8037825235

00:16:41.673 --> 00:16:42.837 if we deplete dopamine,

NOTE Confidence: 0.8037825235

00:16:42.840 --> 00:16:45.180 we should see a reduction in

NOTE Confidence: 0.8037825235

00:16:45.180 --> 00:16:45.960 insulin sensitivity.

NOTE Confidence: 0.8037825235

00:16:45.960 --> 00:16:47.794 And that is indeed what we found

NOTE Confidence: 0.8037825235

00:16:47.794 --> 00:16:50.081 in humans when we blocked dopamine

NOTE Confidence: 0.8037825235

00:16:50.081 --> 00:16:51.997 synthesis blocking tyrosine hydroxylase.

NOTE Confidence: 0.8037825235

00:16:52.000 --> 00:16:55.000 We found that not at the hepatic level,

NOTE Confidence: 0.8037825235

00:16:55.000 --> 00:16:57.125 but we found a decrease

NOTE Confidence: 0.8037825235

00:16:57.125 --> 00:16:58.400 in insulin sensitivity,

NOTE Confidence: 0.8037825235

00:16:58.400 --> 00:17:00.840 showing that dopamine in the

NOTE Confidence: 0.8037825235

00:17:00.840 --> 00:17:02.792 brain also regulates insulin

NOTE Confidence: 0.8037825235

00:17:02.792 --> 00:17:06.720 sensitivity in the body in humans.

NOTE Confidence: 0.8037825235

00:17:06.720 --> 00:17:11.676 So I think that beyond gut peptides,

NOTE Confidence: 0.8037825235

00:17:11.676 --> 00:17:14.910 the striatal dopamine system in the

NOTE Confidence: 0.8037825235

00:17:14.999 --> 00:17:18.118 brain really is a target for future

NOTE Confidence: 0.8037825235

00:17:18.118 --> 00:17:20.613 new medication reducing food intake

NOTE Confidence: 0.8037825235

00:17:20.613 --> 00:17:22.680 and improving metabolic health.

NOTE Confidence: 0.8037825235

00:17:22.680 --> 00:17:25.056 And I think working on and

NOTE Confidence: 0.8037825235

00:17:25.056 --> 00:17:26.640 understanding why nutrient sensing

NOTE Confidence: 0.8037825235

00:17:26.706 --> 00:17:28.844 is so disturbed and whether we can

NOTE Confidence: 0.8037825235

00:17:28.844 --> 00:17:31.414 restore that in the long term with the

NOTE Confidence: 0.8037825235

00:17:31.414 --> 00:17:33.319 new medication is really essential.

NOTE Confidence: 0.8037825235

00:17:33.320 --> 00:17:35.560 So I want to thank all these

NOTE Confidence: 0.8037825235

00:17:35.560 --> 00:17:36.640 people and yourself.

NOTE Confidence: 0.951019698

00:17:44.320 --> 00:17:45.684 Thank you for that.

NOTE Confidence: 0.951019698

00:17:45.684 --> 00:17:48.634 We have time maybe for one or two

NOTE Confidence: 0.951019698

00:17:48.634 --> 00:17:50.800 very quick questions. Yes, Diana.

NOTE Confidence: 0.5877882175

00:17:53.240 --> 00:17:53.720 Oh, there you go.

NOTE Confidence: 0.716807681111111

00:17:54.120 --> 00:17:55.794 Never mind. Do you want to just say it?

NOTE Confidence: 0.716807681111111

00:17:55.800 --> 00:17:58.000 I'll repeat it, I'll repeat it. For the

NOTE Confidence: 0.512718056666667

00:17:58.800 --> 00:18:01.158 current response in the nutrient setting,

NOTE Confidence: 0.512718056666667

00:18:01.160 --> 00:18:03.920 the dopamine system, would you

NOTE Confidence: 0.512718056666667

00:18:03.920 --> 00:18:06.452 advocate for something like a ketogenic

NOTE Confidence: 0.512718056666667

00:18:06.452 --> 00:18:09.920 diet or a little carbohydrate diet

NOTE Confidence: 0.66835914

00:18:09.920 --> 00:18:10.520 to kind of

NOTE Confidence: 0.6474328625

00:18:10.520 --> 00:18:13.380 maintain or reset the system?

NOTE Confidence: 0.6474328625

00:18:13.380 --> 00:18:14.680 Well, that's an interesting thought.

NOTE Confidence: 0.6474328625

00:18:14.680 --> 00:18:15.670 We don't know.

NOTE Confidence: 0.6474328625

00:18:15.670 --> 00:18:18.484 We we do know that fatty acids modulate

NOTE Confidence: 0.6474328625

00:18:18.484 --> 00:18:21.040 the response in the serotonin them

NOTE Confidence: 0.6474328625

00:18:21.040 --> 00:18:23.639 in people with a healthy weight.

NOTE Confidence: 0.6474328625

00:18:23.640 --> 00:18:28.125 So that whether I think that the the

NOTE Confidence: 0.6474328625

00:18:28.125 --> 00:18:30.389 the ketones and fatty acids that

NOTE Confidence: 0.6474328625

00:18:30.389 --> 00:18:32.964 enter the brain that's more you know

NOTE Confidence: 0.6474328625

00:18:32.964 --> 00:18:35.130 that that's a different route than

NOTE Confidence: 0.6474328625

00:18:35.205 --> 00:18:37.637 the vagal afferens in the in the gut.

NOTE Confidence: 0.6474328625

00:18:37.640 --> 00:18:40.290 Whether caloric restriction or intermittent

NOTE Confidence: 0.6474328625

00:18:40.290 --> 00:18:43.432 fasting to increase ketones and and

NOTE Confidence: 0.6474328625

00:18:43.432 --> 00:18:45.916 fatty acids will improve food intake,

NOTE Confidence: 0.6474328625

00:18:45.920 --> 00:18:46.826 we don't know.

NOTE Confidence: 0.6474328625

00:18:46.826 --> 00:18:50.240 But but in in animal models with

NOTE Confidence: 0.6474328625

00:18:50.240 --> 00:18:52.728 you know prolonged intermittent

NOTE Confidence: 0.6474328625

00:18:52.728 --> 00:18:55.383 fasting where where animals or would

NOTE Confidence: 0.6474328625

00:18:55.383 --> 00:18:57.520 only eat for a few hours a day,

NOTE Confidence: 0.6474328625

00:18:57.520 --> 00:19:00.054 they do see all kinds of improvements

NOTE Confidence: 0.6474328625

00:19:00.054 --> 00:19:02.605 in in body weight and in in

NOTE Confidence: 0.6474328625

00:19:02.605 --> 00:19:03.820 memory function etcetera.

NOTE Confidence: 0.6474328625

00:19:03.820 --> 00:19:05.035 So who knows?

NOTE Confidence: 0.6474328625

00:19:05.040 --> 00:19:05.280 Yeah,

NOTE Confidence: 0.950899134

00:19:07.240 --> 00:19:08.600 yes. One more quick question.

NOTE Confidence: 0.969072405714286

00:19:29.120 --> 00:19:32.320 Well, that's a really difficult

NOTE Confidence: 0.969072405714286

00:19:32.320 --> 00:19:35.076 question because mental health in

NOTE Confidence: 0.969072405714286

00:19:35.076 --> 00:19:38.520 people with obesity of course has many.

NOTE Confidence: 0.969072405714286

00:19:38.520 --> 00:19:41.404 You know the the, the etiology of

NOTE Confidence: 0.969072405714286

00:19:41.404 --> 00:19:45.032 that is very complex and I don't know

NOTE Confidence: 0.969072405714286

00:19:45.032 --> 00:19:47.540 whether in humans we can distangle

NOTE Confidence: 0.969072405714286

00:19:47.621 --> 00:19:50.077 these these different factors.

NOTE Confidence: 0.969072405714286

00:19:50.080 --> 00:19:51.790 Given the effects of obesity

NOTE Confidence: 0.969072405714286

00:19:51.790 --> 00:19:53.158 on the serotonin system,

NOTE Confidence: 0.969072405714286

00:19:53.160 --> 00:19:56.604 I can imagine that that might make

NOTE Confidence: 0.969072405714286

00:19:56.604 --> 00:19:59.811 them more prone to to depression,

NOTE Confidence: 0.969072405714286

00:19:59.811 --> 00:20:03.520 but I'm not sure. Yeah, great.

NOTE Confidence: 0.969124146923077

00:20:03.520 --> 00:20:06.490 Thank you very much. And we are going to

NOTE Confidence: 0.969124146923077

00:20:06.490 --> 00:20:09.080 move into our second networking break.