WEBVTT

NOTE duration:"00:58:06"

NOTE recognizability:0.843

NOTE language:en-us

NOTE Confidence: 0.90861503

00:00:00.000 --> 00:00:02.597 And now I have the great pleasure

NOTE Confidence: 0.90861503

00:00:02.597 --> 00:00:04.310 of introducing today's speaker,

NOTE Confidence: 0.90861503

00:00:04.310 --> 00:00:05.954 doctor Erin Flynn Evans.

NOTE Confidence: 0.90861503

00:00:05.954 --> 00:00:08.420 Doctor Evans is a research psychologist

NOTE Confidence: 0.90861503

00:00:08.489 --> 00:00:10.751 at the NASA Ames Research Center

NOTE Confidence: 0.90861503

00:00:10.751 --> 00:00:12.206 in California, where she leads

NOTE Confidence: 0.90861503

00:00:12.206 --> 00:00:14.330 the Fatigue countermeasures lab.

NOTE Confidence: 0.90861503

00:00:14.330 --> 00:00:16.342 She holds a PhD from the University

NOTE Confidence: 0.90861503

00:00:16.342 --> 00:00:18.490 of Surrey, UK, and an MPH from

NOTE Confidence: 0.90861503

00:00:18.490 --> 00:00:20.070 Harvard School of Public Health.

NOTE Confidence: 0.90861503

00:00:20.070 --> 00:00:22.698 She was also certified as an

NOTE Confidence: 0.90861503

00:00:22.698 --> 00:00:25.750 RPSGT from 2002 to two 2012.

NOTE Confidence: 0.90861503

00:00:25.750 --> 00:00:26.944 Prior to joining NASA,

NOTE Confidence: 0.90861503

00:00:26.944 --> 00:00:28.828 she was an instructor in medicine

NOTE Confidence: 0.90861503

00:00:28.830 --> 00:00:31.003 and the Division of Sleep Medicine.

NOTE Confidence: 0.90861503

00:00:31.003 --> 00:00:33.358 Brigham and Women's Hospital and

NOTE Confidence: 0.90861503

00:00:33.358 --> 00:00:35.957 Harvard Medical School and also as a

NOTE Confidence: 0.90861503

00:00:35.957 --> 00:00:38.459 pivotal team in the duty our changes.

NOTE Confidence: 0.90861503

00:00:38.460 --> 00:00:40.535 Doctor Roslyn Evans has extensive

NOTE Confidence: 0.90861503

00:00:40.535 --> 00:00:42.195 research experience examining the

NOTE Confidence: 0.90861503

00:00:42.195 --> 00:00:44.752 short and long term effects of sleep

NOTE Confidence: 0.90861503

00:00:44.752 --> 00:00:46.573 loss and circadian desynchrony in

NOTE Confidence: 0.90861503

00:00:46.573 --> 00:00:48.048 occupational settings including

NOTE Confidence: 0.90861503

00:00:48.048 --> 00:00:50.480 among astronauts, airline pilots,

NOTE Confidence: 0.90861503

00:00:50.480 --> 00:00:52.900 physicians and other shift workers.

NOTE Confidence: 0.90861503

00:00:52.900 --> 00:00:54.888 She's involved in both lab based

NOTE Confidence: 0.90861503

00:00:54.888 --> 00:00:56.176 and field based research.

NOTE Confidence: 0.90861503

00:00:56.180 --> 00:00:58.022 Her lab based research has focused

NOTE Confidence: 0.90861503

00:00:58.022 --> 00:01:00.101 on examining the effects of light

NOTE Confidence: 0.90861503

00:01:00.101 --> 00:01:01.289 and circadian neuroendocrine.

NOTE Confidence: 0.90861503

00:01:01.290 --> 00:01:02.798 And neurobehavioral responses in

NOTE Confidence: 0.90861503

00:01:02.798 --> 00:01:05.060 humans and how these outcomes relate

NOTE Confidence: 0.90861503

00:01:05.124 --> 00:01:06.994 to the development of countermeasures

NOTE Confidence: 0.90861503

00:01:06.994 --> 00:01:09.876 for shift work or field research has

NOTE Confidence: 0.90861503

00:01:09.876 --> 00:01:11.696 involved integrating these measures of

NOTE Confidence: 0.90861503

00:01:11.696 --> 00:01:13.496 fatigue and associated countermeasures

NOTE Confidence: 0.90861503

00:01:13.496 --> 00:01:15.472 into complex operational setting.

NOTE Confidence: 0.90861503

00:01:15.472 --> 00:01:17.390 And she has also received the

NOTE Confidence: 0.90861503

00:01:17.390 --> 00:01:19.195 NASA Honor award for her research

NOTE Confidence: 0.90861503

00:01:19.195 --> 00:01:20.619 and for her management,

NOTE Confidence: 0.90861503

00:01:20.620 --> 00:01:23.168 along with the NASA Superior Accomplishment

NOTE Confidence: 0.870696852

00:01:23.180 --> 00:01:25.360 award. She's also very active

NOTE Confidence: 0.87436044

00:01:25.370 --> 00:01:27.332 with the American Academy of Sleep

NOTE Confidence: 0.87436044

00:01:27.332 --> 00:01:29.280 Medicine and Sleep Research Society.

NOTE Confidence: 0.87436044

00:01:29.280 --> 00:01:31.440 She's a member of their extensive.

NOTE Confidence: 0.87436044

00:01:31.440 --> 00:01:32.946 Extrinsic circadian rhythm

NOTE Confidence: 0.87436044

00:01:32.946 --> 00:01:33.802 disorder guidelines,

NOTE Confidence: 0.87436044

00:01:33.802 --> 00:01:36.370 task force and Public Safety Committee.

NOTE Confidence: 0.87436044

00:01:36.370 --> 00:01:38.512 She also serves as a member of

NOTE Confidence: 0.87436044

00:01:38.512 --> 00:01:39.822 the Impairment Advisory Board

NOTE Confidence: 0.87436044

00:01:39.822 --> 00:01:41.452 and the National Safety Council

NOTE Confidence: 0.87436044

00:01:41.452 --> 00:01:43.628 with her very unique experiences

NOTE Confidence: 0.87436044

00:01:43.630 --> 00:01:44.870 of working with the astronauts,

NOTE Confidence: 0.87436044

00:01:44.870 --> 00:01:47.089 pilots and her work on circadian disruptions,

NOTE Confidence: 0.87436044

00:01:47.090 --> 00:01:49.210 shift work and fatigue mitigation.

NOTE Confidence: 0.87436044

00:01:49.210 --> 00:01:50.800 It is with great delight and

NOTE Confidence: 0.87436044

00:01:50.800 --> 00:01:52.180 enthusiasm that I would like to

NOTE Confidence: 0.87436044

00:01:52.180 --> 00:01:53.961 hand it over to doctor Flynn Evans

NOTE Confidence: 0.87436044

00:01:53.961 --> 00:01:55.515 to share her experiences with us

NOTE Confidence: 0.87436044

00:01:55.568 --> 00:01:57.248 and thank you again for joining us.

NOTE Confidence: 0.888688441111111

00:01:59.380 --> 00:02:01.972 Oh, well, thank you so much for that

NOTE Confidence: 0.888688441111111

00:02:01.972 --> 00:02:03.568 introduction, Dr. Papa. That was.

NOTE Confidence: 0.836837118181818

00:02:05.750 --> 00:02:07.794 I feel, I hope I can live

NOTE Confidence: 0.836837118181818

00:02:07.794 --> 00:02:09.810 up to that introduction.

NOTE Confidence: 0.836837118181818

00:02:09.810 --> 00:02:11.001 That was amazing.

NOTE Confidence: 0.836837118181818

00:02:11.001 --> 00:02:13.780 So thank you so much for the

NOTE Confidence: 0.836837118181818

00:02:13.867 --> 00:02:16.089 invitation to speak today.

NOTE Confidence: 0.836837118181818

00:02:16.089 --> 00:02:19.260 I I did speak actually a couple

NOTE Confidence: 0.836837118181818

00:02:19.364 --> 00:02:21.968 of years ago to this group,

NOTE Confidence: 0.836837118181818

00:02:21.970 --> 00:02:25.546 and during that talk I discussed

NOTE Confidence: 0.836837118181818

00:02:25.546 --> 00:02:28.910 my work in Space Flight,

NOTE Confidence: 0.836837118181818

00:02:28.910 --> 00:02:30.390 studying sleep and circadian

NOTE Confidence: 0.836837118181818

00:02:30.390 --> 00:02:31.500 rhythms and astronauts.

NOTE Confidence: 0.836837118181818

00:02:31.500 --> 00:02:32.928 So this is a little bit different.

NOTE Confidence: 0.836837118181818

00:02:32.930 --> 00:02:34.110 And today I'll be talking

NOTE Confidence: 0.836837118181818

00:02:34.110 --> 00:02:35.290 about some of the other.

NOTE Confidence: 0.836837118181818

00:02:35.290 --> 00:02:37.582 Work that we do specifically around

NOTE Confidence: 0.836837118181818

00:02:37.582 --> 00:02:39.670 managing sleep loss and circadian

NOTE Confidence: 0.836837118181818

00:02:39.670 --> 00:02:41.638 misalignment and shift work,

NOTE Confidence: 0.836837118181818

00:02:41.640 --> 00:02:45.100 so I don't have any.

NOTE Confidence: 0.836837118181818

00:02:45.100 --> 00:02:47.104 Financial relationships with

NOTE Confidence: 0.836837118181818

00:02:47.104 --> 00:02:49.968 ineligible companies and I am sure

NOTE Confidence: 0.836837118181818

00:02:49.968 --> 00:02:53.168 I'll leave this here for a moment so

NOTE Confidence: 0.836837118181818

00:02:53.168 --> 00:02:56.730 you can text for your CME credit.

NOTE Confidence: 0.836837118181818

00:02:56.730 --> 00:02:59.870 And hopefully. That's enough.

NOTE Confidence: 0.836837118181818

00:02:59.870 --> 00:03:00.930 All right.

NOTE Confidence: 0.836837118181818

00:03:00.930 --> 00:03:02.430 So to begin,

NOTE Confidence: 0.836837118181818

00:03:02.430 --> 00:03:06.310 you may wonder just why someone from NASA

NOTE Confidence: 0.836837118181818

00:03:06.406 --> 00:03:10.018 is here to speak about best practices.

NOTE Confidence: 0.836837118181818

00:03:10.020 --> 00:03:10.445 Firstly,

NOTE Confidence: 0.836837118181818

00:03:10.445 --> 00:03:12.145 alas and circadian misalignment

NOTE Confidence: 0.836837118181818

00:03:12.145 --> 00:03:13.420 and shift work.

NOTE Confidence: 0.836837118181818

00:03:13.420 --> 00:03:15.904 And so I thought I'd just start with a

NOTE Confidence: 0.836837118181818

00:03:15.904 --> 00:03:18.114 couple of slides describing what NASA

NOTE Confidence: 0.836837118181818

00:03:18.114 --> 00:03:21.220 does and then where I fit into that puzzle.

NOTE Confidence: 0.836837118181818

00:03:21.220 --> 00:03:22.948 So I'm sure that you've heard

NOTE Confidence: 0.836837118181818

00:03:22.948 --> 00:03:24.100 of Johnson Space Center,

NOTE Confidence: 0.836837118181818

00:03:24.100 --> 00:03:26.018 where we have Mission Control for astronauts.

NOTE Confidence: 0.836837118181818

00:03:26.020 --> 00:03:27.340 I'm sure that you've heard

NOTE Confidence: 0.836837118181818

00:03:27.340 --> 00:03:28.396 of Kennedy Space Center,

NOTE Confidence: 0.836837118181818

00:03:28.400 --> 00:03:29.942 where we do many of our

NOTE Confidence: 0.836837118181818

00:03:29.942 --> 00:03:30.713 launches and landings.

NOTE Confidence: 0.836837118181818

00:03:30.720 --> 00:03:32.348 For our space missions,

NOTE Confidence: 0.836837118181818

00:03:32.348 --> 00:03:36.201 but we actually have 10 centers at NASA and

NOTE Confidence: 0.836837118181818

00:03:36.201 --> 00:03:38.865 these centers all have distinct functions.

NOTE Confidence: 0.836837118181818

00:03:38.870 --> 00:03:39.956 We have some,

NOTE Confidence: 0.836837118181818

00:03:39.956 --> 00:03:41.766 we have Goddard Space Center,

NOTE Confidence: 0.836837118181818

00:03:41.770 --> 00:03:44.078 which is focused on

NOTE Confidence: 0.836837118181818

00:03:44.078 --> 00:03:45.809 astrophysics and astronomy.

NOTE Confidence: 0.836837118181818

00:03:45.810 --> 00:03:47.840 We have Glenn Research Center,

NOTE Confidence: 0.836837118181818

00:03:47.840 --> 00:03:49.410 which is focused on aeronautics,

NOTE Confidence: 0.836837118181818

00:03:49.410 --> 00:03:50.718 Langley Research Center.

NOTE Confidence: 0.836837118181818

00:03:50.718 --> 00:03:52.026 We have JPL,

NOTE Confidence: 0.836837118181818

00:03:52.030 --> 00:03:53.619 which I'm sure you've also heard of,

NOTE Confidence: 0.836837118181818

00:03:53.620 --> 00:03:55.783 where we do most of the Mission

NOTE Confidence: 0.836837118181818

00:03:55.783 --> 00:03:57.808 Control work for our Mars Rovers.

NOTE Confidence: 0.836837118181818

00:03:57.810 --> 00:04:00.942 And then I work up here in the California.

NOTE Confidence: 0.836837118181818

00:04:00.950 --> 00:04:03.799 Bay Area at NASA Ames Research Center.

NOTE Confidence: 0.836837118181818

00:04:03.800 --> 00:04:07.250 And you know, I'm probably biased,

NOTE Confidence: 0.836837118181818

00:04:07.250 --> 00:04:09.374 but I do think our center is the best,

NOTE Confidence: 0.836837118181818

00:04:09.380 --> 00:04:11.770 especially for research because it

NOTE Confidence: 0.836837118181818

00:04:11.770 --> 00:04:14.750 operates much like a university campus.

NOTE Confidence: 0.836837118181818

00:04:14.750 --> 00:04:16.940 So we are a government agency,

NOTE Confidence: 0.836837118181818

00:04:16.940 --> 00:04:19.260 but we are sort of the the research

NOTE Confidence: 0.836837118181818

00:04:19.260 --> 00:04:21.803 test bed for all of the work that

NOTE Confidence: 0.836837118181818

00:04:21.803 --> 00:04:24.058 happens around the rest of the agency.

NOTE Confidence: 0.836837118181818

00:04:24.060 --> 00:04:26.276 So we have people at NASA Ames who

NOTE Confidence: 0.836837118181818

00:04:26.276 --> 00:04:28.539 are doing work in molecular biology,

NOTE Confidence: 0.836837118181818

00:04:28.540 --> 00:04:31.450 who are doing work in materials.

NOTE Confidence: 0.836837118181818

00:04:31.450 --> 00:04:31.974 Engineering.

NOTE Confidence: 0.836837118181818

00:04:31.974 --> 00:04:35.118 And then in human systems integration,

NOTE Confidence: 0.836837118181818

00:04:35.120 --> 00:04:37.478 which is where my lab falls.

NOTE Confidence: 0.836837118181818

00:04:37.480 --> 00:04:39.240 And in my lab,

NOTE Confidence: 0.836837118181818

00:04:39.240 --> 00:04:41.440 my lab is the fatigue

NOTE Confidence: 0.836837118181818

00:04:41.440 --> 00:04:42.900 countermeasures laboratory.

NOTE Confidence: 0.836837118181818

00:04:42.900 --> 00:04:44.340 I didn't name it,

NOTE Confidence: 0.836837118181818

00:04:44.340 --> 00:04:46.880 and I'll get in a minute into what,

NOTE Confidence: 0.836837118181818

00:04:46.880 --> 00:04:49.197 how I feel about the word fatigue.

NOTE Confidence: 0.836837118181818

00:04:49.200 --> 00:04:50.248 But in my lab,

NOTE Confidence: 0.836837118181818

00:04:50.248 --> 00:04:51.820 we do Space Flight research again.

NOTE Confidence: 0.836837118181818

00:04:51.820 --> 00:04:53.110 That's what I spoke about

NOTE Confidence: 0.836837118181818

00:04:53.110 --> 00:04:54.400 a couple of years ago.

NOTE Confidence: 0.836837118181818

00:04:54.400 --> 00:04:57.368 And then we also do aeronautics work

NOTE Confidence: 0.836837118181818

00:04:57.368 --> 00:05:00.323 and mission operations support and with

NOTE Confidence: 0.836837118181818

00:05:00.323 --> 00:05:02.567 aeronautics and mission operations.

NOTE Confidence: 0.836837118181818

00:05:02.570 --> 00:05:04.448 Much of the work that we

NOTE Confidence: 0.836837118181818

00:05:04.448 --> 00:05:06.490 do here is both research.

NOTE Confidence: 0.836837118181818

00:05:06.490 --> 00:05:09.340 So we do studies to characterize

NOTE Confidence: 0.836837118181818

00:05:09.340 --> 00:05:12.280 problems and to better understand how

NOTE Confidence: 0.836837118181818

00:05:12.280 --> 00:05:15.605 people cope with the types of shift

NOTE Confidence: 0.836837118181818

00:05:15.605 --> 00:05:18.847 work schedules that they have to do.

NOTE Confidence: 0.836837118181818

00:05:18.850 --> 00:05:21.928 And then we also deploy countermeasures.

NOTE Confidence: 0.836837118181818

00:05:21.930 --> 00:05:23.622 And so sometimes that's a very

NOTE Confidence: 0.836837118181818

00:05:23.622 --> 00:05:24.750 formal process where we're

NOTE Confidence: 0.836051021818182

00:05:24.800 --> 00:05:26.837 doing a research study in step testing

NOTE Confidence: 0.836051021818182

00:05:26.837 --> 00:05:28.609 the effectiveness of a countermeasure,

NOTE Confidence: 0.836051021818182

00:05:28.610 --> 00:05:30.920 but sometimes that's just taking the

NOTE Confidence: 0.836051021818182

00:05:30.920 --> 00:05:33.288 knowledge that we've learned from a study.

NOTE Confidence: 0.836051021818182

00:05:33.290 --> 00:05:35.822 And deploying the countermeasure

NOTE Confidence: 0.836051021818182

00:05:35.822 --> 00:05:38.987 broadly across a particular population.

NOTE Confidence: 0.836051021818182

00:05:38.990 --> 00:05:41.798 And so the majority of what I'm going to

NOTE Confidence: 0.836051021818182

00:05:41.798 --> 00:05:44.740 talk to you about today really is based on

NOTE Confidence: 0.836051021818182

00:05:44.740 --> 00:05:47.534 the work that we do in these two areas.

NOTE Confidence: 0.836051021818182

00:05:47.540 --> 00:05:50.690 So overall today, I just want to

NOTE Confidence: 0.836051021818182

00:05:50.690 --> 00:05:53.259 quickly cover shift work biology.

NOTE Confidence: 0.836051021818182

00:05:53.260 --> 00:05:54.660 I only have a couple of slides here.

NOTE Confidence: 0.836051021818182

00:05:54.660 --> 00:05:57.252 I know I'm talking to a a Sleep

NOTE Confidence: 0.836051021818182

00:05:57.252 --> 00:05:57.900 Medicine group.

NOTE Confidence: 0.836051021818182

00:05:57.900 --> 00:06:01.268 And so I think that you're all very

NOTE Confidence: 0.836051021818182

00:06:01.268 --> 00:06:03.658 knowledgeable in this area already.

NOTE Confidence: 0.836051021818182

00:06:03.660 --> 00:06:05.649 But to make sure we're on the same page,

NOTE Confidence: 0.836051021818182

00:06:05.650 --> 00:06:07.540 I'll cover a couple of basics and

NOTE Confidence: 0.836051021818182

00:06:07.540 --> 00:06:09.598 then I'll talk about some of the

NOTE Confidence: 0.836051021818182

00:06:09.598 --> 00:06:11.386 short and long term health outcomes

NOTE Confidence: 0.836051021818182

00:06:11.443 --> 00:06:12.958 that are associated with shift

NOTE Confidence: 0.836051021818182

00:06:12.958 --> 00:06:14.975 work and I'll spend the majority

NOTE Confidence: 0.836051021818182

00:06:14.975 --> 00:06:17.450 of time talking about mitigations.

NOTE Confidence: 0.836051021818182

00:06:17.450 --> 00:06:20.090 So what is fatigue risk management,

NOTE Confidence: 0.836051021818182

00:06:20.090 --> 00:06:23.266 how do we implement it and how can

NOTE Confidence: 0.836051021818182

00:06:23.266 --> 00:06:25.299 that potentially be translated

NOTE Confidence: 0.836051021818182

00:06:25.299 --> 00:06:27.030 to patient populations?

NOTE Confidence: 0.836051021818182

00:06:27.030 --> 00:06:30.046 Much of the work that I'll talk about

NOTE Confidence: 0.836051021818182

00:06:30.046 --> 00:06:32.932 today comes from a task force that I

NOTE Confidence: 0.836051021818182

00:06:32.932 --> 00:06:35.420 was involved in that was sponsored by

NOTE Confidence: 0.836051021818182

00:06:35.420 --> 00:06:37.610 the American Academy of Sleep Medicine

NOTE Confidence: 0.836051021818182

00:06:37.673 --> 00:06:39.558 and the Sleep Research Society.

NOTE Confidence: 0.836051021818182

00:06:39.560 --> 00:06:42.560 This was an amazing group of

NOTE Confidence: 0.836051021818182

00:06:42.560 --> 00:06:45.147 researchers and clinicians that came

NOTE Confidence: 0.836051021818182

00:06:45.147 --> 00:06:48.147 together with the ultimate goal of

NOTE Confidence: 0.836051021818182

00:06:48.147 --> 00:06:50.776 trying to understand how the length

NOTE Confidence: 0.836051021818182

00:06:50.776 --> 00:06:53.656 of a shift would impact alertness,

NOTE Confidence: 0.836051021818182

00:06:53.656 --> 00:06:55.868 performance, health, and safety.

NOTE Confidence: 0.836051021818182

00:06:55.868 --> 00:06:57.350 But as we.

NOTE Confidence: 0.836051021818182

00:06:57.350 --> 00:06:59.954 Really got into this as our working

NOTE Confidence: 0.836051021818182

00:06:59.954 --> 00:07:00.584 group met.

NOTE Confidence: 0.836051021818182

00:07:00.584 --> 00:07:02.108 You know we we were scheduled

NOTE Confidence: 0.836051021818182

00:07:02.108 --> 00:07:03.710 I think for 8 hours a day.

NOTE Confidence: 0.836051021818182

00:07:03.710 --> 00:07:06.790 We ended up being at the ASM offices

NOTE Confidence: 0.836051021818182

00:07:06.790 --> 00:07:08.965 for something like 12 hours a

NOTE Confidence: 0.836051021818182

00:07:08.965 --> 00:07:11.495 day because we had lots and lots

NOTE Confidence: 0.836051021818182

00:07:11.495 --> 00:07:13.695 of discussion about this topic.

NOTE Confidence: 0.836051021818182

00:07:13.695 --> 00:07:16.245 We really came to the conclusion,

NOTE Confidence: 0.836051021818182

00:07:16.250 --> 00:07:17.540 which I think probably will

NOTE Confidence: 0.836051021818182

00:07:17.540 --> 00:07:18.830 resonate with many of you,

NOTE Confidence: 0.836051021818182

00:07:18.830 --> 00:07:21.142 that when it comes to shift work the

NOTE Confidence: 0.836051021818182

00:07:21.142 --> 00:07:23.238 answer is almost always it depends

NOTE Confidence: 0.836051021818182

00:07:23.238 --> 00:07:25.939 because you can't really apply A1 size

NOTE Confidence: 0.836051021818182

00:07:25.939 --> 00:07:28.189 fits all recommendation or strategies.

NOTE Confidence: 0.836051021818182

00:07:28.190 --> 00:07:31.460 Every population to every occupation,

NOTE Confidence: 0.836051021818182

00:07:31.460 --> 00:07:33.791 you really have to look at the

NOTE Confidence: 0.836051021818182

00:07:33.791 --> 00:07:35.579 characteristics of a work group,

NOTE Confidence: 0.836051021818182

00:07:35.580 --> 00:07:37.180 the characteristics of the

NOTE Confidence: 0.836051021818182

00:07:37.180 --> 00:07:39.180 individuals within that work group,

NOTE Confidence: 0.836051021818182

00:07:39.180 --> 00:07:43.009 and then the potential consequences of any.

NOTE Confidence: 0.836051021818182

00:07:43.010 --> 00:07:47.126 Accidents or incidents that may come from.

NOTE Confidence: 0.836051021818182

00:07:47.130 --> 00:07:49.720 Excessive sleepiness within a population.

NOTE Confidence: 0.836051021818182

00:07:49.720 --> 00:07:52.416 And so this.

NOTE Confidence: 0.836051021818182

00:07:52.416 --> 00:07:55.896 Article is really, you know,

NOTE Confidence: 0.836051021818182

00:07:55.900 --> 00:07:57.436 a nice, I think,

NOTE Confidence: 0.836051021818182

00:07:57.436 --> 00:08:00.140 summary of what I'll talk about here

NOTE Confidence: 0.836051021818182

00:08:00.140 --> 00:08:02.317 it I'll give you the Cliff notes.

NOTE Confidence: 0.836051021818182

00:08:02.320 --> 00:08:04.282 The article goes into more detail

NOTE Confidence: 0.836051021818182

00:08:04.282 --> 00:08:07.004 on all of these topics if you're

NOTE Confidence: 0.836051021818182

00:08:07.004 --> 00:08:08.796 interested in further reading.

NOTE Confidence: 0.836051021818182

00:08:08.800 --> 00:08:11.240 So to begin shift work,

NOTE Confidence: 0.836051021818182

00:08:11.240 --> 00:08:13.552 it is a term that can be very

NOTE Confidence: 0.836051021818182

00:08:13.552 --> 00:08:14.680 difficult to define.

NOTE Confidence: 0.836051021818182

00:08:14.680 --> 00:08:16.552 I think we all sort of know what

NOTE Confidence: 0.836051021818182

00:08:16.552 --> 00:08:17.240 shift work is,

NOTE Confidence: 0.836051021818182

00:08:17.240 --> 00:08:18.899 but when it comes to putting down

NOTE Confidence: 0.836051021818182

00:08:18.899 --> 00:08:19.373 a definition,

NOTE Confidence: 0.836051021818182

00:08:19.380 --> 00:08:20.540 if you ask 20 people,

NOTE Confidence: 0.836051021818182

00:08:20.540 --> 00:08:23.600 you'll probably get 20 different definitions.

NOTE Confidence: 0.836051021818182

00:08:23.600 --> 00:08:26.033 I just grabbed this from dictionary.com,

NOTE Confidence: 0.836051021818182

00:08:26.033 --> 00:08:28.697 but I I really actually like this definition,

NOTE Confidence: 0.836051021818182

00:08:28.700 --> 00:08:30.821 which is just a system of employment

NOTE Confidence: 0.836051021818182

00:08:30.821 --> 00:08:32.315 where an individual's normal work

NOTE Confidence: 0.836051021818182

00:08:32.315 --> 00:08:34.085 hours are in part outside the

NOTE Confidence: 0.836051021818182

00:08:34.085 --> 00:08:35.787 period of normal day working and

NOTE Confidence: 0.836051021818182

00:08:35.787 --> 00:08:37.142 may follow a different pattern

NOTE Confidence: 0.847659484

00:08:37.192 --> 00:08:38.787 and consecutive periods of weeks.

NOTE Confidence: 0.847659484

00:08:38.790 --> 00:08:40.746 And I like this definition in

NOTE Confidence: 0.847659484

00:08:40.746 --> 00:08:42.914 particular because I think a lot of

NOTE Confidence: 0.847659484

00:08:42.914 --> 00:08:44.790 times when we think about shift work,

NOTE Confidence: 0.847659484

00:08:44.790 --> 00:08:46.895 many people are thinking about

NOTE Confidence: 0.847659484

00:08:46.895 --> 00:08:49.430 night work or rotating shift work.

NOTE Confidence: 0.847659484

00:08:49.430 --> 00:08:52.190 And in reality, we have many people in

NOTE Confidence: 0.847659484

00:08:52.190 --> 00:08:54.412 many different occupations who have to

NOTE Confidence: 0.847659484

00:08:54.412 --> 00:08:56.930 work what many would classify as day.

NOTE Confidence: 0.847659484

00:08:56.930 --> 00:08:58.664 But where those shifts start maybe

NOTE Confidence: 0.847659484

00:08:58.664 --> 00:09:01.351 at 5:00 in the morning or where maybe

NOTE Confidence: 0.847659484

00:09:01.351 --> 00:09:03.186 those shifts end around midnight,

NOTE Confidence: 0.847659484

00:09:03.190 --> 00:09:05.745 you know, is that really a daytime?

NOTE Confidence: 0.847659484

00:09:05.750 --> 00:09:07.190 You know, it's partly daytime,

NOTE Confidence: 0.847659484

00:09:07.190 --> 00:09:08.780 but it's really kind of shifted.

NOTE Confidence: 0.847659484

00:09:08.780 --> 00:09:11.654 Outside of what the normal human

NOTE Confidence: 0.847659484

00:09:11.654 --> 00:09:13.570 diurnal pattern would allow,

NOTE Confidence: 0.847659484

00:09:13.570 --> 00:09:16.391 you know with a sort of entrained

NOTE Confidence: 0.847659484

00:09:16.391 --> 00:09:17.197 circadian rhythm.

NOTE Confidence: 0.847659484

00:09:17.200 --> 00:09:19.800 So when I talk about shift shift work,

NOTE Confidence: 0.847659484

00:09:19.800 --> 00:09:23.111 I am thinking more globally about these

NOTE Confidence: 0.847659484

00:09:23.111 --> 00:09:26.080 more nuanced types of shifts as well.

NOTE Confidence: 0.847659484

00:09:26.080 --> 00:09:28.020 And then, you know,

NOTE Confidence: 0.847659484

00:09:28.020 --> 00:09:30.445 just thinking about shift work

NOTE Confidence: 0.847659484

00:09:30.445 --> 00:09:32.819 and what the issues are,

NOTE Confidence: 0.847659484

00:09:32.820 --> 00:09:34.696 you know, first I think you know,

NOTE Confidence: 0.847659484

00:09:34.700 --> 00:09:37.190 you need to understand the biology

NOTE Confidence: 0.847659484

00:09:37.190 --> 00:09:38.435 of shift work.

NOTE Confidence: 0.847659484

00:09:38.440 --> 00:09:40.776 So what is happening in the body when

NOTE Confidence: 0.847659484

00:09:40.776 --> 00:09:43.079 we're working against our biological clock?

NOTE Confidence: 0.847659484

00:09:43.080 --> 00:09:46.573 And then what are the consequences that

NOTE Confidence: 0.847659484

00:09:46.573 --> 00:09:49.029 follow misalignment between our sleep

NOTE Confidence: 0.847659484

00:09:49.029 --> 00:09:51.657 wake timing and our circadian timing?

NOTE Confidence: 0.847659484

00:09:51.660 --> 00:09:52.796 For example,

NOTE Confidence: 0.847659484

00:09:52.796 --> 00:09:55.068 what are the consequences

NOTE Confidence: 0.847659484

00:09:55.068 --> 00:09:57.030 of peripheral misalignment?

NOTE Confidence: 0.847659484

00:09:57.030 --> 00:10:00.505 Peripheral clock misalignment and then,

NOTE Confidence: 0.847659484

00:10:00.510 --> 00:10:01.380 you know, finally,

NOTE Confidence: 0.847659484

00:10:01.380 --> 00:10:03.410 what can we do to mitigate that?

NOTE Confidence: 0.847659484

00:10:03.410 --> 00:10:04.890 We're probably never going to

NOTE Confidence: 0.847659484

00:10:04.890 --> 00:10:05.778 eliminate shift work.

NOTE Confidence: 0.847659484

00:10:05.780 --> 00:10:09.364 We're going to continue to have people who,

NOTE Confidence: 0.847659484

00:10:09.370 --> 00:10:11.302 you know, demand to have their

NOTE Confidence: 0.847659484

00:10:11.302 --> 00:10:12.268 packages shipped overnight.

NOTE Confidence: 0.847659484

00:10:12.270 --> 00:10:13.950 We're going to have people,

NOTE Confidence: 0.847659484

00:10:13.950 --> 00:10:14.436 you know,

NOTE Confidence: 0.847659484

00:10:14.436 --> 00:10:15.894 who want to travel to Europe.

NOTE Confidence: 0.847659484

00:10:15.900 --> 00:10:17.394 You really have to have pilots

NOTE Confidence: 0.847659484

00:10:17.394 --> 00:10:19.042 who are able to fly overnight

NOTE Confidence: 0.847659484

00:10:19.042 --> 00:10:20.830 to be able to accomplish that.

NOTE Confidence: 0.847659484

00:10:20.830 --> 00:10:25.009 And so in thinking about shift work,

NOTE Confidence: 0.847659484

00:10:25.010 --> 00:10:27.730 what we're really trying to do is mitigate.

NOTE Confidence: 0.847659484

00:10:27.730 --> 00:10:29.220 The consequences of shift work

NOTE Confidence: 0.847659484

00:10:29.220 --> 00:10:31.349 both in the short and long term,

NOTE Confidence: 0.847659484

00:10:31.350 --> 00:10:34.602 so that we can continue to

NOTE Confidence: 0.847659484

00:10:34.602 --> 00:10:38.459 operate in this 24 hour society.

NOTE Confidence: 0.847659484

00:10:38.460 --> 00:10:40.452 Now I know probably everyone here

NOTE Confidence: 0.847659484

00:10:40.452 --> 00:10:42.623 is familiar with the two process

NOTE Confidence: 0.847659484

00:10:42.623 --> 00:10:44.558 right model of sleep regulation,

NOTE Confidence: 0.847659484

00:10:44.560 --> 00:10:45.700 but I, I you know,

NOTE Confidence: 0.847659484

00:10:45.700 --> 00:10:48.458 I think it's really important to just

NOTE Confidence: 0.847659484

00:10:48.458 --> 00:10:51.648 start with the basics and thinking about

NOTE Confidence: 0.847659484

00:10:51.648 --> 00:10:54.478 how shift work influences our bodies.

NOTE Confidence: 0.847659484

00:10:54.478 --> 00:10:58.070 So of course we have the homeostatic Dr.

NOTE Confidence: 0.847659484

00:10:58.070 --> 00:11:00.996 which I've plotted here in light blue,

NOTE Confidence: 0.847659484

00:11:01.000 --> 00:11:03.240 which in an untrained individual of course

NOTE Confidence: 0.847659484

00:11:03.240 --> 00:11:05.444 builds up over the course of the day

NOTE Confidence: 0.847659484

00:11:05.444 --> 00:11:07.809 and then we have the circadian drive for.

NOTE Confidence: 0.847659484

00:11:07.810 --> 00:11:09.854 Make, which is in the darker blue,

NOTE Confidence: 0.847659484

00:11:09.860 --> 00:11:11.788 which sort of counteracts

NOTE Confidence: 0.847659484

00:11:11.788 --> 00:11:13.234 that homeostatic Dr.

NOTE Confidence: 0.847659484

00:11:13.240 --> 00:11:15.200 and then with shift work,

NOTE Confidence: 0.847659484

00:11:15.200 --> 00:11:18.032 you know, of course we all know the

NOTE Confidence: 0.847659484

00:11:18.032 --> 00:11:19.858 consequences of shift work are,

NOTE Confidence: 0.847659484

00:11:19.860 --> 00:11:20.702 you know,

NOTE Confidence: 0.847659484

00:11:20.702 --> 00:11:23.228 we continue to stay awake potentially

NOTE Confidence: 0.847659484

00:11:23.228 --> 00:11:25.340 through that biological night.

NOTE Confidence: 0.847659484

00:11:25.340 --> 00:11:27.559 Certainly that's the case for night work.

NOTE Confidence: 0.847659484

00:11:27.560 --> 00:11:30.976 And we may have a much elevated homeostatic

NOTE Confidence: 0.847659484

00:11:30.976 --> 00:11:33.598 sleep pressure happening at that time.

NOTE Confidence: 0.847659484

00:11:33.600 --> 00:11:35.274 And then when shift workers then

NOTE Confidence: 0.847659484

00:11:35.274 --> 00:11:36.880 try to sleep during the day,

NOTE Confidence: 0.847659484

00:11:36.880 --> 00:11:38.480 even though they may be going to sleep.

NOTE Confidence: 0.847659484

00:11:38.480 --> 00:11:40.412 The time when they have a very

NOTE Confidence: 0.847659484

00:11:40.412 --> 00:11:41.240 high sleep pressure,

NOTE Confidence: 0.847659484

00:11:41.240 --> 00:11:43.040 they're sleeping at a time

NOTE Confidence: 0.847659484

00:11:43.040 --> 00:11:44.840 when the circadian drive to

NOTE Confidence: 0.822638461538462

00:11:44.907 --> 00:11:47.440 be awake is opposing their ability to sleep.

NOTE Confidence: 0.822638461538462

00:11:47.440 --> 00:11:50.520 And so of course that leads to sleep

NOTE Confidence: 0.822638461538462

00:11:50.520 --> 00:11:52.531 fragmentation and potentially and

NOTE Confidence: 0.822638461538462

00:11:52.531 --> 00:11:55.436 typically sleep of insufficient duration.

NOTE Confidence: 0.822638461538462

00:11:55.440 --> 00:11:58.048 And so that compounds the problem because not

NOTE Confidence: 0.822638461538462

00:11:58.048 --> 00:12:00.909 only do we now have a circadian misalignment

NOTE Confidence: 0.822638461538462

00:12:00.909 --> 00:12:03.080 issue with sleep with shift work,

NOTE Confidence: 0.822638461538462

00:12:03.080 --> 00:12:05.528 we also have a sleep loss

NOTE Confidence: 0.822638461538462

00:12:05.528 --> 00:12:07.160 problem with shift work.

NOTE Confidence: 0.822638461538462

00:12:07.160 --> 00:12:09.878 And then, you know, of course it gets worse.

NOTE Confidence: 0.822638461538462

00:12:09.880 --> 00:12:12.274 You know, I, I'm sure many of you are

NOTE Confidence: 0.822638461538462

00:12:12.274 --> 00:12:14.048 working on a peripheral oscillator

NOTE Confidence: 0.822638461538462

00:12:14.048 --> 00:12:16.214 systems and are probably much more

NOTE Confidence: 0.822638461538462

00:12:16.276 --> 00:12:18.202 knowledgeable about, you know,

NOTE Confidence: 0.822638461538462

00:12:18.202 --> 00:12:20.057 each of these individual areas.

NOTE Confidence: 0.822638461538462

00:12:20.060 --> 00:12:22.755 But I am. But really when it

NOTE Confidence: 0.822638461538462

00:12:22.755 --> 00:12:24.900 comes to circadian Physiology,

NOTE Confidence: 0.822638461538462

00:12:24.900 --> 00:12:26.344 we're not just thinking

NOTE Confidence: 0.822638461538462

00:12:26.344 --> 00:12:28.149 about the sleep wake cycle.

NOTE Confidence: 0.822638461538462

00:12:28.150 --> 00:12:28.794 You know,

NOTE Confidence: 0.822638461538462

00:12:28.794 --> 00:12:30.726 the sleep wake cycle is important

NOTE Confidence: 0.822638461538462

00:12:30.726 --> 00:12:33.021 and we want to make sure that

NOTE Confidence: 0.822638461538462

00:12:33.021 --> 00:12:34.990 people who are engaging in shift

NOTE Confidence: 0.822638461538462

00:12:34.990 --> 00:12:37.244 work are able to get enough sleep.

NOTE Confidence: 0.822638461538462

00:12:37.250 --> 00:12:40.130 To manage their awake time,

NOTE Confidence: 0.822638461538462

00:12:40.130 --> 00:12:42.058 we want to make sure that they're able

NOTE Confidence: 0.822638461538462

00:12:42.058 --> 00:12:44.166 to stay alert during their awake time.

NOTE Confidence: 0.822638461538462

00:12:44.170 --> 00:12:47.908 But we also have these downstream clocks,

NOTE Confidence: 0.822638461538462

00:12:47.910 --> 00:12:50.045 all these peripheral oscillators and

NOTE Confidence: 0.822638461538462

00:12:50.045 --> 00:12:52.180 virtually every body system that

NOTE Confidence: 0.822638461538462

00:12:52.243 --> 00:12:54.313 are receiving information from the

NOTE Confidence: 0.822638461538462

00:12:54.313 --> 00:12:56.383 Super cosmetic nucleus that are,

NOTE Confidence: 0.822638461538462

00:12:56.390 --> 00:12:57.278 you know,

NOTE Confidence: 0.822638461538462

00:12:57.278 --> 00:12:59.498 then coordinating other aspects of

NOTE Confidence: 0.822638461538462

00:12:59.498 --> 00:13:01.952 biological function which can lead to

NOTE Confidence: 0.822638461538462

00:13:01.952 --> 00:13:04.064 symptoms that are not always clinical,

NOTE Confidence: 0.822638461538462

00:13:04.070 --> 00:13:05.336 sometimes subclinical symptoms

NOTE Confidence: 0.822638461538462

00:13:05.336 --> 00:13:07.024 that can make shift.

NOTE Confidence: 0.822638461538462

00:13:07.030 --> 00:13:08.656 Workers, you know,

NOTE Confidence: 0.822638461538462

00:13:08.656 --> 00:13:11.366 Colin Stack or or feel

NOTE Confidence: 0.822638461538462

00:13:11.366 --> 00:13:13.109 uncomfortable or or in,

NOTE Confidence: 0.822638461538462

00:13:13.110 --> 00:13:15.784 you know the worst case scenario over

NOTE Confidence: 0.822638461538462

00:13:15.784 --> 00:13:18.763 years of shift work can lead to chronic

NOTE Confidence: 0.822638461538462

00:13:18.763 --> 00:13:21.678 conditions and and clinical conditions.

NOTE Confidence: 0.822638461538462

00:13:21.680 --> 00:13:23.984 And so we have to think about the

NOTE Confidence: 0.822638461538462

00:13:23.984 --> 00:13:25.898 big picture when we're thinking

NOTE Confidence: 0.822638461538462

00:13:25.898 --> 00:13:28.018 about shift work and mitigations,

NOTE Confidence: 0.822638461538462

00:13:28.020 --> 00:13:28.982 you know,

NOTE Confidence: 0.822638461538462

00:13:28.982 --> 00:13:31.868 promoting alertness and performance on the

NOTE Confidence: 0.822638461538462

00:13:31.868 --> 00:13:35.637 job and sleep at home is really important.

NOTE Confidence: 0.822638461538462

00:13:35.640 --> 00:13:37.504 But I think we also have to think.

NOTE Confidence: 0.822638461538462

00:13:37.510 --> 00:13:40.742 This future of how do we ensure that

NOTE Confidence: 0.822638461538462

00:13:40.742 --> 00:13:43.117 shift workers health is preserved to

NOTE Confidence: 0.822638461538462

00:13:43.117 --> 00:13:46.337 the best that it can be as they're

NOTE Confidence: 0.822638461538462

00:13:46.337 --> 00:13:49.953 engaging in potentially a life of shift work?

NOTE Confidence: 0.822638461538462

00:13:49.960 --> 00:13:54.080 So breaking that down a little bit more,

NOTE Confidence: 0.822638461538462

00:13:54.080 --> 00:13:57.034 you know when I think of these

NOTE Confidence: 0.822638461538462

00:13:57.034 --> 00:13:59.124 longer term consequences on the

NOTE Confidence: 0.822638461538462

00:13:59.124 --> 00:14:00.984 short term I'm thinking of.

NOTE Confidence: 0.822638461538462

00:14:00.990 --> 00:14:03.685 You just what are the immediate effects?

NOTE Confidence: 0.822638461538462

00:14:03.690 --> 00:14:07.060 You know what what are we dealing with on a

NOTE Confidence: 0.822638461538462

00:14:07.148 --> 00:14:10.368 given shift during a given sleep episode?

NOTE Confidence: 0.822638461538462

00:14:10.370 --> 00:14:13.010 And then in the long term, you know,

NOTE Confidence: 0.822638461538462

00:14:13.010 --> 00:14:14.960 what are the potential consequences

NOTE Confidence: 0.822638461538462

00:14:14.960 --> 00:14:16.530 in a person's life?

NOTE Confidence: 0.822638461538462

00:14:16.530 --> 00:14:20.065 Are they going to be able to?

NOTE Confidence: 0.822638461538462

00:14:20.070 --> 00:14:21.980 Maintain work for you know,

NOTE Confidence: 0.822638461538462

00:14:21.980 --> 00:14:24.290 their entire.

NOTE Confidence: 0.822638461538462

00:14:24.290 --> 00:14:27.326 You know, we're typical working lifespan.

NOTE Confidence: 0.822638461538462

00:14:27.330 --> 00:14:29.490 Are they going to make it to retirement

NOTE Confidence: 0.822638461538462

00:14:29.490 --> 00:14:31.685 able to work or are they going to

NOTE Confidence: 0.822638461538462

00:14:31.685 --> 00:14:33.479 develop some sort of chronic condition

NOTE Confidence: 0.822638461538462

00:14:33.479 --> 00:14:35.507 that is going to prevent the,

NOTE Confidence: 0.822638461538462

00:14:35.510 --> 00:14:37.918 that's going to take them out of

NOTE Confidence: 0.822638461538462

00:14:37.918 --> 00:14:38.950 the workforce prematurely.

NOTE Confidence: 0.822638461538462

00:14:38.950 --> 00:14:40.630 We need to protect against these

NOTE Confidence: 0.822638461538462

00:14:40.630 --> 00:14:42.207 things as well and certainly

NOTE Confidence: 0.822638461538462

00:14:42.207 --> 00:14:44.177 against like say premature death.

NOTE Confidence: 0.907559795714286

00:14:46.400 --> 00:14:47.978 There are many consequences of shift

NOTE Confidence: 0.907559795714286

00:14:47.978 --> 00:14:50.077 work both in the short and long term.

NOTE Confidence: 0.907559795714286

00:14:50.080 --> 00:14:52.500 But I just want to hit on a couple of

NOTE Confidence: 0.907559795714286

00:14:52.566 --> 00:14:55.720 them here, just as probably a reminder.

NOTE Confidence: 0.907559795714286

00:14:55.720 --> 00:14:58.008 So in my lab, I think probably the

NOTE Confidence: 0.907559795714286

00:14:58.008 --> 00:15:00.229 biggest focus that we have is on

NOTE Confidence: 0.907559795714286

00:15:00.229 --> 00:15:01.493 this reduced cognitive function

NOTE Confidence: 0.907559795714286

00:15:01.493 --> 00:15:03.430 in the short term on the job.

NOTE Confidence: 0.907559795714286

00:15:03.430 --> 00:15:06.335 Again, the populations that I work with,

NOTE Confidence: 0.907559795714286

00:15:06.340 --> 00:15:07.912 you know, specifically,

NOTE Confidence: 0.907559795714286

00:15:07.912 --> 00:15:09.582 you know, the astronauts,

NOTE Confidence: 0.907559795714286

00:15:09.582 --> 00:15:11.448 pilots and then people who are

NOTE Confidence: 0.907559795714286

00:15:11.448 --> 00:15:13.017 working on different missions at

NOTE Confidence: 0.907559795714286

00:15:13.017 --> 00:15:15.250 NASA really want to know how can I?

NOTE Confidence: 0.907559795714286

00:15:15.250 --> 00:15:18.634 Stay awake and alert on the job and

NOTE Confidence: 0.907559795714286

00:15:18.634 --> 00:15:20.138 particularly because, you know,

NOTE Confidence: 0.907559795714286

00:15:20.138 --> 00:15:22.441 many of the occupations that I work

NOTE Confidence: 0.907559795714286

00:15:22.441 --> 00:15:25.108 in are safety sensitive occupations.

NOTE Confidence: 0.907559795714286

00:15:25.110 --> 00:15:25.806 You know,

NOTE Confidence: 0.907559795714286

00:15:25.806 --> 00:15:27.546 the management in those groups

NOTE Confidence: 0.907559795714286

00:15:27.546 --> 00:15:29.620 want to make sure that everyone

NOTE Confidence: 0.907559795714286

00:15:29.620 --> 00:15:32.321 is going to stay safe and that the

NOTE Confidence: 0.907559795714286

00:15:32.321 --> 00:15:34.601 populations of people who say who

NOTE Confidence: 0.907559795714286

00:15:34.601 --> 00:15:36.611 are traveling around the country on

NOTE Confidence: 0.907559795714286

00:15:36.611 --> 00:15:38.620 airplanes are also going to stay safe.

NOTE Confidence: 0.907559795714286

00:15:38.620 --> 00:15:40.420 So we're really concerned about

NOTE Confidence: 0.907559795714286

00:15:40.420 --> 00:15:42.468 making sure that, you know,

NOTE Confidence: 0.907559795714286

00:15:42.468 --> 00:15:43.920 sleepiness is managed,

NOTE Confidence: 0.907559795714286

00:15:43.920 --> 00:15:46.790 that accident risk is reduced.

NOTE Confidence: 0.907559795714286

00:15:46.790 --> 00:15:49.163 But we also have other short term

NOTE Confidence: 0.907559795714286

00:15:49.163 --> 00:15:51.289 conditions that are made that maybe

NOTE Confidence: 0.907559795714286

00:15:51.289 --> 00:15:53.019 you know garner less attention

NOTE Confidence: 0.907559795714286

00:15:53.019 --> 00:15:54.930 but are equally important.

NOTE Confidence: 0.907559795714286

00:15:54.930 --> 00:15:56.442 So you know in the short term

NOTE Confidence: 0.907559795714286

00:15:56.442 --> 00:15:58.399 we we see increased burnout and

NOTE Confidence: 0.907559795714286

00:15:58.399 --> 00:15:59.647 poor behavioral health,

NOTE Confidence: 0.907559795714286

00:15:59.650 --> 00:16:02.630 so increased risk of depersonalization

NOTE Confidence: 0.907559795714286

00:16:02.630 --> 00:16:05.610 among hospital employees towards patients,

NOTE Confidence: 0.907559795714286

00:16:05.610 --> 00:16:08.130 increased risk of anxiety and depression.

NOTE Confidence: 0.907559795714286

00:16:08.130 --> 00:16:10.234 And then again kind of going back to

NOTE Confidence: 0.907559795714286

00:16:10.234 --> 00:16:11.930 something you mentioned previously,

NOTE Confidence: 0.907559795714286

00:16:11.930 --> 00:16:14.030 we also see an increase in

NOTE Confidence: 0.907559795714286

00:16:14.030 --> 00:16:14.730 subclinical conditions.

NOTE Confidence: 0.907559795714286

00:16:14.730 --> 00:16:16.305 This can lead to more sick calls.

NOTE Confidence: 0.907559795714286

00:16:16.310 --> 00:16:17.363 Long shift workers,

NOTE Confidence: 0.907559795714286

00:16:17.363 --> 00:16:18.416 so GI distress,

NOTE Confidence: 0.907559795714286

00:16:18.420 --> 00:16:18.864 headache,

NOTE Confidence: 0.907559795714286

00:16:18.864 --> 00:16:21.528 reduced immune function all come in

NOTE Confidence: 0.907559795714286

00:16:21.528 --> 00:16:24.199 the short term with insufficient

NOTE Confidence: 0.907559795714286

00:16:24.199 --> 00:16:26.715 sleep and circadian misalignment.

NOTE Confidence: 0.907559795714286

00:16:26.720 --> 00:16:28.816 And then in the longer term we have,

NOTE Confidence: 0.907559795714286

00:16:28.820 --> 00:16:29.618 you know,

NOTE Confidence: 0.907559795714286

00:16:29.618 --> 00:16:31.613 some pretty serious consequences that

NOTE Confidence: 0.907559795714286

00:16:31.613 --> 00:16:34.188 can come with years of shift work.

NOTE Confidence: 0.907559795714286

00:16:34.190 --> 00:16:34.443 Again,

NOTE Confidence: 0.907559795714286

00:16:34.443 --> 00:16:36.214 I'm sure there are people on this

NOTE Confidence: 0.907559795714286

00:16:36.214 --> 00:16:38.116 call who are working in this space.

NOTE Confidence: 0.907559795714286

00:16:38.120 --> 00:16:40.928 I know many of my current and former

NOTE Confidence: 0.907559795714286

00:16:40.928 --> 00:16:43.104 colleagues who work on individual

NOTE Confidence: 0.907559795714286

00:16:43.104 --> 00:16:45.444 aspects of of these long-term

NOTE Confidence: 0.907559795714286

00:16:45.444 --> 00:16:47.140 investigating these long-term.

NOTE Confidence: 0.907559795714286

00:16:47.140 --> 00:16:47.614 Conditions,

NOTE Confidence: 0.907559795714286

00:16:47.614 --> 00:16:50.458 but we see increased risk of

NOTE Confidence: 0.907559795714286

00:16:50.458 --> 00:16:51.406 metabolic disorders.

NOTE Confidence: 0.907559795714286

00:16:51.410 --> 00:16:54.026 Um vascular events and then cancer.

NOTE Confidence: 0.907559795714286

00:16:54.030 --> 00:16:56.208 And prior to coming to NASA,

NOTE Confidence: 0.907559795714286

00:16:56.210 --> 00:16:58.023 one of the cancer was an area

NOTE Confidence: 0.907559795714286

00:16:58.023 --> 00:16:59.050 that I worked on.

NOTE Confidence: 0.907559795714286

00:16:59.050 --> 00:17:00.842 So I.

NOTE Confidence: 0.907559795714286

00:17:00.842 --> 00:17:07.114 Examined how years of shift work influenced

NOTE Confidence: 0.907559795714286

00:17:07.114 --> 00:17:09.930 an individual's risk of prostate cancer.

NOTE Confidence: 0.907559795714286

00:17:09.930 --> 00:17:13.045 There are many other people who are

NOTE Confidence: 0.907559795714286

00:17:13.045 --> 00:17:15.310 working on examining the associations

NOTE Confidence: 0.907559795714286

00:17:15.310 --> 00:17:17.635 between breast cancer and shift

NOTE Confidence: 0.907559795714286

00:17:17.635 --> 00:17:20.817 work and as well as other cancers.

NOTE Confidence: 0.907559795714286

00:17:20.820 --> 00:17:22.156 But hormone dependent cancers

NOTE Confidence: 0.907559795714286

00:17:22.156 --> 00:17:24.160 seem to have the strongest links,

NOTE Confidence: 0.907559795714286

00:17:24.160 --> 00:17:25.552 and at this point,

NOTE Confidence: 0.907559795714286

00:17:25.552 --> 00:17:27.292 the World Health Organization has

NOTE Confidence: 0.907559795714286

00:17:27.292 --> 00:17:29.358 labeled shift work as a probable

NOTE Confidence: 0.907559795714286

00:17:29.358 --> 00:17:31.013 carcinogen based on the evidence

NOTE Confidence: 0.907559795714286

00:17:31.072 --> 00:17:32.059 that's been done.

NOTE Confidence: 0.907559795714286

00:17:32.060 --> 00:17:33.062 In this area,

NOTE Confidence: 0.907559795714286

00:17:33.062 --> 00:17:35.400 so I think it's also important for

NOTE Confidence: 0.907559795714286

00:17:35.476 --> 00:17:37.916 shift workers to understand that

NOTE Confidence: 0.907559795714286

00:17:37.916 --> 00:17:39.868 there are long-term consequences

NOTE Confidence: 0.907559795714286

00:17:39.868 --> 00:17:42.306 that can come in conjunction with

NOTE Confidence: 0.907559795714286

00:17:42.306 --> 00:17:46.370 their choice to engage in shift work.

NOTE Confidence: 0.907559795714286

00:17:46.370 --> 00:17:50.666 So shifting gears a little bit.

NOTE Confidence: 0.907559795714286

00:17:50.670 --> 00:17:53.886 Now I'm going to start to get into,

NOTE Confidence: 0.907559795714286

00:17:53.890 --> 00:17:56.230 you know, what the mitigations are,

NOTE Confidence: 0.907559795714286

00:17:56.230 --> 00:17:58.558 what are the things that we can do

NOTE Confidence: 0.907559795714286

00:17:58.558 --> 00:18:01.564 to help people stay more alert on the job,

NOTE Confidence: 0.849582087

00:18:01.570 --> 00:18:04.349 to help mitigate some of those short-term

NOTE Confidence: 0.849582087

00:18:04.349 --> 00:18:06.383 consequences and then hopefully mitigate

NOTE Confidence: 0.849582087

00:18:06.383 --> 00:18:09.503 some of the long term consequences as well.

NOTE Confidence: 0.849582087

00:18:09.510 --> 00:18:10.980 And to do this, I'm going to

NOTE Confidence: 0.849582087

00:18:10.980 --> 00:18:12.734 talk to you about the framework

NOTE Confidence: 0.849582087

00:18:12.734 --> 00:18:14.150 of fatigue risk management.

NOTE Confidence: 0.849582087

00:18:14.150 --> 00:18:15.638 But before we can talk about

NOTE Confidence: 0.849582087

00:18:15.638 --> 00:18:16.382 fatigue risk management,

NOTE Confidence: 0.849582087

00:18:16.390 --> 00:18:18.250 we need to define fatigue.

NOTE Confidence: 0.849582087

00:18:18.250 --> 00:18:21.200 And so fatigue, you know.

NOTE Confidence: 0.849582087

00:18:21.200 --> 00:18:24.176 Similar to shift work is something that I

NOTE Confidence: 0.849582087

00:18:24.176 --> 00:18:26.917 think everyone kind of has a definition for,

NOTE Confidence: 0.849582087

00:18:26.920 --> 00:18:29.545 but most people will have

NOTE Confidence: 0.849582087

00:18:29.545 --> 00:18:31.120 a different definition.

NOTE Confidence: 0.849582087

00:18:31.120 --> 00:18:33.695 And so I personally really

NOTE Confidence: 0.849582087

00:18:33.695 --> 00:18:35.755 hate the term fatigue.

NOTE Confidence: 0.849582087

00:18:35.760 --> 00:18:38.523 When I came to NASA and my lab was

NOTE Confidence: 0.849582087

00:18:38.523 --> 00:18:40.714 called the Fatigue Countermeasures

NOTE Confidence: 0.849582087

00:18:40.714 --> 00:18:43.114 Laboratory before I arrived,

NOTE Confidence: 0.849582087

00:18:43.120 --> 00:18:44.528 I wasn't particularly excited

NOTE Confidence: 0.849582087

00:18:44.528 --> 00:18:46.288 about that and I explored

NOTE Confidence: 0.849582087

00:18:46.288 --> 00:18:47.780 trying to change the name,

NOTE Confidence: 0.849582087

00:18:47.780 --> 00:18:48.590 but it was sort of.

NOTE Confidence: 0.905702753809524

00:18:50.630 --> 00:18:52.238 Prevented from doing so.

NOTE Confidence: 0.905702753809524

00:18:52.238 --> 00:18:54.248 We're strongly encouraged not to

NOTE Confidence: 0.905702753809524

00:18:54.248 --> 00:18:56.688 do so by some of the other people

NOTE Confidence: 0.905702753809524

00:18:56.688 --> 00:18:58.720 who work at NASA. So we kept it.

NOTE Confidence: 0.905702753809524

00:18:58.720 --> 00:19:00.956 But now I just try to make sure that

NOTE Confidence: 0.905702753809524

00:19:00.956 --> 00:19:02.978 whenever I'm working with the population,

NOTE Confidence: 0.905702753809524

00:19:02.980 --> 00:19:04.084 I'm defining fatigue.

NOTE Confidence: 0.905702753809524

00:19:04.084 --> 00:19:05.556 Because in my lab,

NOTE Confidence: 0.905702753809524

00:19:05.560 --> 00:19:07.835 we're not talking about fatigue as a

NOTE Confidence: 0.905702753809524

00:19:07.835 --> 00:19:10.338 side effect of some medical condition.

NOTE Confidence: 0.905702753809524

00:19:10.340 --> 00:19:12.836 We're not talking about physical fatigue.

NOTE Confidence: 0.905702753809524

00:19:12.840 --> 00:19:15.050 We're talking really about what

NOTE Confidence: 0.905702753809524

00:19:15.050 --> 00:19:17.760 I've put on the screen here.

NOTE Confidence: 0.905702753809524

00:19:17.760 --> 00:19:20.120 This comes from the International

NOTE Confidence: 0.905702753809524

00:19:20.120 --> 00:19:21.536 Civil Aviation Organization.

NOTE Confidence: 0.905702753809524

00:19:21.540 --> 00:19:24.276 So it is very aviation focused,

NOTE Confidence: 0.905702753809524

00:19:24.280 --> 00:19:26.534 but I I think that the key

NOTE Confidence: 0.905702753809524

00:19:26.534 --> 00:19:28.710 is that we're talking about.

NOTE Confidence: 0.905702753809524

00:19:28.710 --> 00:19:30.760 Reduced mental or physical performance

NOTE Confidence: 0.905702753809524

00:19:30.760 --> 00:19:32.810 capability resulting from sleep loss,

NOTE Confidence: 0.905702753809524

00:19:32.810 --> 00:19:33.962 extended wakefulness,

NOTE Confidence: 0.905702753809524

00:19:33.962 --> 00:19:36.266 circadian phase or workload.

NOTE Confidence: 0.905702753809524

00:19:36.270 --> 00:19:38.160 And in my lab we we definitely

NOTE Confidence: 0.905702753809524

00:19:38.160 --> 00:19:40.050 don't focus as much on workload.

NOTE Confidence: 0.905702753809524

00:19:40.050 --> 00:19:41.710 We do incorporate it into

NOTE Confidence: 0.905702753809524

00:19:41.710 --> 00:19:43.370 the studies that we do,

NOTE Confidence: 0.905702753809524

00:19:43.370 --> 00:19:47.066 but I'm most focused on the,

NOTE Confidence: 0.905702753809524

00:19:47.070 --> 00:19:49.105 you know the the physiological

NOTE Confidence: 0.905702753809524

00:19:49.105 --> 00:19:51.140 touch points that we targets

NOTE Confidence: 0.905702753809524

00:19:51.211 --> 00:19:53.346 that we can potentially change.

NOTE Confidence: 0.905702753809524

00:19:53.350 --> 00:19:55.288 And so it's really about sleep

NOTE Confidence: 0.905702753809524

00:19:55.288 --> 00:19:57.264 and circadian rhythms in the end

NOTE Confidence: 0.905702753809524

00:19:57.264 --> 00:19:58.814 when when I'm thinking about.

NOTE Confidence: 0.905702753809524

00:19:58.820 --> 00:20:01.319 To you in using the word fatigue.

NOTE Confidence: 0.905702753809524

00:20:01.320 --> 00:20:03.720 So what is fatigue risk management?

NOTE Confidence: 0.905702753809524

00:20:03.720 --> 00:20:04.285 Well,

NOTE Confidence: 0.905702753809524

00:20:04.285 --> 00:20:07.675 fatigue risk management is a formal

NOTE Confidence: 0.905702753809524

00:20:07.675 --> 00:20:11.523 process that has been developed

NOTE Confidence: 0.905702753809524

00:20:11.523 --> 00:20:13.338 and shaped over many years,

NOTE Confidence: 0.905702753809524

00:20:13.340 --> 00:20:15.524 particularly in safety

NOTE Confidence: 0.905702753809524

00:20:15.524 --> 00:20:16.980 sensitive organizations,

NOTE Confidence: 0.905702753809524

00:20:16.980 --> 00:20:20.900 to provide workers in a given occupation with

NOTE Confidence: 0.905702753809524

00:20:20.900 --> 00:20:25.000 tools and resources to manage their fatigue,

NOTE Confidence: 0.905702753809524

00:20:25.000 --> 00:20:27.448 so to manage their sleep loss and to

NOTE Confidence: 0.905702753809524

00:20:27.448 --> 00:20:29.559 manage their circadian misalignment.

NOTE Confidence: 0.905702753809524

00:20:29.560 --> 00:20:33.450 And fatigue risk management is.

NOTE Confidence: 0.905702753809524

00:20:33.450 --> 00:20:34.036 You know,

NOTE Confidence: 0.905702753809524

00:20:34.036 --> 00:20:35.794 it's much more than just giving

NOTE Confidence: 0.905702753809524

00:20:35.794 --> 00:20:36.670 someone a tip.

NOTE Confidence: 0.905702753809524

00:20:36.670 --> 00:20:43.060 Sheet Tigers management is typically a.

NOTE Confidence: 0.905702753809524

00:20:43.060 --> 00:20:44.383 Within an organization,

NOTE Confidence: 0.905702753809524

00:20:44.383 --> 00:20:47.029 a sort of separate work group,

NOTE Confidence: 0.905702753809524

00:20:47.030 --> 00:20:50.621 so there are people who are designated

NOTE Confidence: 0.905702753809524

00:20:50.621 --> 00:20:54.803 as fatigue risk managers who will collect

NOTE Confidence: 0.905702753809524

00:20:54.803 --> 00:20:57.983 data continuously to characterize risk

NOTE Confidence: 0.905702753809524

00:20:57.983 --> 00:21:01.855 in the organization as they see the,

NOTE Confidence: 0.905702753809524

00:21:01.860 --> 00:21:02.742 you know,

NOTE Confidence: 0.905702753809524

00:21:02.742 --> 00:21:06.270 see risk arise as a result of maybe

NOTE Confidence: 0.905702753809524

00:21:06.270 --> 00:21:09.966 a particular type of work activity

NOTE Confidence: 0.905702753809524

00:21:09.970 --> 00:21:13.066 affecting people in a negative way.

NOTE Confidence: 0.905702753809524

00:21:13.070 --> 00:21:13.602 Well,

NOTE Confidence: 0.905702753809524

00:21:13.602 --> 00:21:16.794 maybe try to implement some countermeasure

NOTE Confidence: 0.905702753809524

00:21:16.800 --> 00:21:20.174 or schedule change and then we'll reassess.

NOTE Confidence: 0.905702753809524

00:21:20.180 --> 00:21:23.274 And this is just continuous and iterative,

NOTE Confidence: 0.905702753809524

00:21:23.280 --> 00:21:25.506 trying to make sure that as fatigue

NOTE Confidence: 0.905702753809524

00:21:25.506 --> 00:21:27.414 hotspots pop up, they're managed.

NOTE Confidence: 0.905702753809524

00:21:27.414 --> 00:21:30.276 And then in addition to that,

NOTE Confidence: 0.905702753809524

00:21:30.280 --> 00:21:32.880 fatigue risk management program really

NOTE Confidence: 0.905702753809524

00:21:32.880 --> 00:21:36.330 needs to provide education to workforce.

NOTE Confidence: 0.905702753809524

00:21:36.330 --> 00:21:39.935 So it's not just about a single

NOTE Confidence: 0.905702753809524

00:21:39.935 --> 00:21:43.256 strategy or a single, a single.

NOTE Confidence: 0.905702753809524

00:21:43.256 --> 00:21:43.684 Uh,

NOTE Confidence: 0.905702753809524

00:21:43.684 --> 00:21:44.540 you know,

NOTE Confidence: 0.905702753809524

00:21:44.540 --> 00:21:48.296 appointment where a plan is developed,

NOTE Confidence: 0.905702753809524

00:21:48.300 --> 00:21:50.990 typically fatigue risk management involves

NOTE Confidence: 0.905702753809524

00:21:50.990 --> 00:21:53.680 ongoing education for the workforce.

NOTE Confidence: 0.905702753809524

00:21:53.680 --> 00:21:56.008 So overall when we think about

NOTE Confidence: 0.905702753809524

00:21:56.008 --> 00:21:57.172 fatigue risk management,

NOTE Confidence: 0.905702753809524

00:21:57.180 --> 00:22:00.306 we're thinking about a dual responsibility

NOTE Confidence: 0.905702753809524

00:22:00.306 --> 00:22:04.158 between the worker and the the organization.

NOTE Confidence: 0.905702753809524

00:22:04.160 --> 00:22:05.910 It's not just that all the burden

NOTE Confidence: 0.905702753809524

00:22:05.910 --> 00:22:07.987 is on the worker and I understand

NOTE Confidence: 0.905702753809524

00:22:07.987 --> 00:22:09.877 that in a clinical setting you

NOTE Confidence: 0.905702753809524

00:22:09.935 --> 00:22:12.185 know you're really dealing with an

NOTE Confidence: 0.905702753809524

00:22:12.185 --> 00:22:14.672 individual you're not dealing with.

NOTE Confidence: 0.905702753809524

00:22:14.672 --> 00:22:15.728 An institution,

NOTE Confidence: 0.905702753809524

00:22:15.730 --> 00:22:19.050 but there may be ways that you can

NOTE Confidence: 0.905702753809524

00:22:19.050 --> 00:22:22.754 talk to patients about you know

NOTE Confidence: 0.905702753809524

00:22:22.754 --> 00:22:24.838 considering you know employers that

NOTE Confidence: 0.905702753809524

00:22:24.838 --> 00:22:26.920 are that have fatigue risk management

NOTE Confidence: 0.905702753809524

00:22:26.986 --> 00:22:29.206 programs particularly if they struggle.

NOTE Confidence: 0.905702753809524

00:22:29.210 --> 00:22:33.144 So for example in trucking there are,

NOTE Confidence: 0.905702753809524

00:22:33.150 --> 00:22:34.526 there are trucking organizations

NOTE Confidence: 0.905702753809524

00:22:34.526 --> 00:22:36.590 that have really robust fatigue risk

NOTE Confidence: 0.860366052777778

00:22:36.644 --> 00:22:37.598 management programs and

NOTE Confidence: 0.860366052777778

00:22:37.598 --> 00:22:39.188 there are those that don't.

NOTE Confidence: 0.860366052777778

00:22:39.190 --> 00:22:40.966 And so you know for patients

NOTE Confidence: 0.860366052777778

00:22:40.966 --> 00:22:42.835 who are vulnerable it it again

NOTE Confidence: 0.860366052777778

00:22:42.835 --> 00:22:44.400 may be worth a conversation.

NOTE Confidence: 0.860366052777778

00:22:44.400 --> 00:22:47.220 To discuss, uh, maybe you know,

NOTE Confidence: 0.860366052777778

00:22:47.220 --> 00:22:50.451 trying to shift to an employer that will be

NOTE Confidence: 0.860366052777778

00:22:50.451 --> 00:22:55.378 more supportive of the nature of the job.

NOTE Confidence: 0.860366052777778

00:22:55.380 --> 00:22:58.158 So how can fatigue risk management

NOTE Confidence: 0.860366052777778

00:22:58.158 --> 00:23:00.932 be used to mitigate the issues

NOTE Confidence: 0.860366052777778

00:23:00.932 --> 00:23:03.440 that we see with shift work?

NOTE Confidence: 0.860366052777778

00:23:03.440 --> 00:23:05.955 So again, these are institutional

NOTE Confidence: 0.860366052777778

00:23:05.955 --> 00:23:09.288 and individual and I'm going to talk

NOTE Confidence: 0.860366052777778

00:23:09.288 --> 00:23:12.580 about both to give you an overview

NOTE Confidence: 0.860366052777778

00:23:12.580 --> 00:23:15.088 and knowing that we can't necessarily

NOTE Confidence: 0.860366052777778

00:23:15.088 --> 00:23:18.199 implement change at the institutional level.

NOTE Confidence: 0.860366052777778

00:23:18.200 --> 00:23:21.735 There may be other ways that that

NOTE Confidence: 0.860366052777778

00:23:21.735 --> 00:23:24.660 individuals can take advantage of

NOTE Confidence: 0.860366052777778

00:23:24.660 --> 00:23:27.000 those institutional best practices.

NOTE Confidence: 0.860366052777778

00:23:27.000 --> 00:23:29.820 So at the institutional level,

NOTE Confidence: 0.860366052777778

00:23:29.820 --> 00:23:32.250 what we're really looking at are

NOTE Confidence: 0.860366052777778

00:23:32.250 --> 00:23:34.692 policies that promote sleep health,

NOTE Confidence: 0.860366052777778

00:23:34.692 --> 00:23:35.780 you know,

NOTE Confidence: 0.860366052777778

00:23:35.780 --> 00:23:38.114 policies that help reduce on the

NOTE Confidence: 0.860366052777778

00:23:38.114 --> 00:23:39.670 job sleepiness that continued

NOTE Confidence: 0.860366052777778

00:23:39.735 --> 00:23:42.369 education and training and also not

NOTE Confidence: 0.860366052777778

00:23:42.369 --> 00:23:44.125 just deployment of countermeasures

NOTE Confidence: 0.860366052777778

00:23:44.191 --> 00:23:46.200 but training on how to use them.

NOTE Confidence: 0.860366052777778

00:23:46.200 --> 00:23:48.360 So I'll talk a little bit about light,

NOTE Confidence: 0.860366052777778

00:23:48.360 --> 00:23:49.612 for example,

NOTE Confidence: 0.860366052777778

00:23:49.612 --> 00:23:53.994 you can't just deploy light boxes into.

NOTE Confidence: 0.860366052777778

00:23:54.000 --> 00:23:56.130 Workspace and expect that people

NOTE Confidence: 0.860366052777778

00:23:56.130 --> 00:23:57.834 will benefit from them.

NOTE Confidence: 0.860366052777778

00:23:57.840 --> 00:23:59.880 You have to actually have training

NOTE Confidence: 0.860366052777778

00:23:59.880 --> 00:24:02.000 so that people know what to do,

NOTE Confidence: 0.860366052777778

00:24:02.000 --> 00:24:03.967 how to use them and how to

NOTE Confidence: 0.860366052777778

00:24:03.967 --> 00:24:04.810 receive their benefit,

NOTE Confidence: 0.860366052777778

00:24:04.810 --> 00:24:07.450 and then infrastructure to support

NOTE Confidence: 0.860366052777778

00:24:07.450 --> 00:24:09.034 the countermeasure implementation.

NOTE Confidence: 0.860366052777778

00:24:09.040 --> 00:24:10.216 So, you know,

NOTE Confidence: 0.860366052777778

00:24:10.216 --> 00:24:12.960 simple example here would be nap rooms.

NOTE Confidence: 0.860366052777778

00:24:12.960 --> 00:24:13.504 You know,

NOTE Confidence: 0.860366052777778

00:24:13.504 --> 00:24:16.057 if you have an employee who like this is

NOTE Confidence: 0.860366052777778

00:24:16.057 --> 00:24:18.248 exhausted and leaning against a wall and

NOTE Confidence: 0.860366052777778

00:24:18.248 --> 00:24:20.499 catching a couple of minutes of sleep,

NOTE Confidence: 0.860366052777778

00:24:20.500 --> 00:24:22.844 that's not a particularly

NOTE Confidence: 0.860366052777778

00:24:22.844 --> 00:24:24.016 supportive environment.

NOTE Confidence: 0.860366052777778

00:24:24.020 --> 00:24:26.407 So to go through each of these

NOTE Confidence: 0.860366052777778

00:24:26.407 --> 00:24:28.810 in a little bit more detail.

NOTE Confidence: 0.860366052777778

00:24:28.810 --> 00:24:31.390 These are some examples of policies

NOTE Confidence: 0.860366052777778

00:24:31.390 --> 00:24:34.132 that the best institutions have for

NOTE Confidence: 0.860366052777778

00:24:34.132 --> 00:24:36.028 fatigue risk management support.

NOTE Confidence: 0.860366052777778

00:24:36.030 --> 00:24:38.406 So just having a fatigue risk

NOTE Confidence: 0.860366052777778

00:24:38.406 --> 00:24:40.890 management program is a first step.

NOTE Confidence: 0.860366052777778

00:24:40.890 --> 00:24:43.389 And note this is required in aviation.

NOTE Confidence: 0.860366052777778

00:24:43.390 --> 00:24:45.526 So I'm going to take you through an

NOTE Confidence: 0.860366052777778

00:24:45.526 --> 00:24:47.991 example on when we get to the end of

NOTE Confidence: 0.860366052777778

00:24:47.991 --> 00:24:50.247 this describing what is required in aviation.

NOTE Confidence: 0.860366052777778

00:24:50.250 --> 00:24:54.554 But I think aviation provides a really nice.

NOTE Confidence: 0.860366052777778

00:24:54.560 --> 00:24:57.128 Set of lessons learned that could

NOTE Confidence: 0.860366052777778

00:24:57.128 --> 00:25:00.060 be adopted in other organizations.

NOTE Confidence: 0.860366052777778

00:25:00.060 --> 00:25:01.299 Thoughtful schedule design.

NOTE Confidence: 0.860366052777778

00:25:01.299 --> 00:25:02.538 So we know,

NOTE Confidence: 0.860366052777778

00:25:02.540 --> 00:25:03.224 you know,

NOTE Confidence: 0.860366052777778

00:25:03.224 --> 00:25:05.960 we know so much about how schedules are

NOTE Confidence: 0.860366052777778

00:25:06.031 --> 00:25:08.623 best designed to minimize fatigue and

NOTE Confidence: 0.860366052777778

00:25:08.623 --> 00:25:10.865 to enhance alertness and performance

NOTE Confidence: 0.860366052777778

00:25:10.865 --> 00:25:13.917 and promote sleep even for shift work.

NOTE Confidence: 0.860366052777778

00:25:13.920 --> 00:25:16.895 And so companies that have put some

NOTE Confidence: 0.860366052777778

00:25:16.895 --> 00:25:19.458 effort into schedule design so that

NOTE Confidence: 0.860366052777778

00:25:19.458 --> 00:25:22.272 they're not just plugging in people as

NOTE Confidence: 0.860366052777778

00:25:22.356 --> 00:25:25.695 commodities wherever they need to fill time.

NOTE Confidence: 0.860366052777778

00:25:25.700 --> 00:25:27.590 But rather, um,

NOTE Confidence: 0.860366052777778

00:25:27.590 --> 00:25:29.480 designing schedules that

NOTE Confidence: 0.860366052777778

00:25:29.480 --> 00:25:32.000 work with human biology.

NOTE Confidence: 0.860366052777778

00:25:32.000 --> 00:25:33.490 And this is where bio

NOTE Confidence: 0.860366052777778

00:25:33.490 --> 00:25:34.980 mathematical models come in on.

NOTE Confidence: 0.860366052777778

00:25:34.980 --> 00:25:37.650 Bio mathematical models have matured

NOTE Confidence: 0.860366052777778

00:25:37.650 --> 00:25:41.458 to a point where many companies are

NOTE Confidence: 0.860366052777778

00:25:41.458 --> 00:25:43.836 now selling bio mathematical models

NOTE Confidence: 0.860366052777778

00:25:43.836 --> 00:25:46.620 that use the cheap process model,

NOTE Confidence: 0.860366052777778

00:25:46.620 --> 00:25:48.580 usually at the core,

NOTE Confidence: 0.860366052777778

00:25:48.580 --> 00:25:50.540 to help design schedules.

NOTE Confidence: 0.860366052777778

00:25:50.540 --> 00:25:53.634 And so by using bio mathematical models,

NOTE Confidence: 0.860366052777778

00:25:53.640 --> 00:25:55.472 you know, schedule design,

NOTE Confidence: 0.860366052777778

00:25:55.472 --> 00:25:56.846 you can scale.

NOTE Confidence: 0.860366052777778

00:25:56.850 --> 00:26:00.602 The schedule of a workforce and this is

NOTE Confidence: 0.860366052777778

00:26:00.602 --> 00:26:04.349 another area where I think aviation excels.

NOTE Confidence: 0.860366052777778

00:26:04.350 --> 00:26:06.054 Virtually every airline around

NOTE Confidence: 0.860366052777778

00:26:06.054 --> 00:26:08.610 the world uses some sort of

NOTE Confidence: 0.860366052777778

00:26:08.688 --> 00:26:10.332 bio mathematical model based

NOTE Confidence: 0.860366052777778

00:26:10.332 --> 00:26:12.798 on the two process model to

NOTE Confidence: 0.848067492

00:26:12.879 --> 00:26:15.812 help schedule pilots to try to minimize

NOTE Confidence: 0.848067492

00:26:15.812 --> 00:26:18.690 their fatigue and maximize their sleep,

NOTE Confidence: 0.848067492

00:26:18.690 --> 00:26:21.390 non punitive reporting of fatigue.

NOTE Confidence: 0.848067492

00:26:21.390 --> 00:26:23.568 So I think in many situations,

NOTE Confidence: 0.848067492

00:26:23.570 --> 00:26:24.944 particularly in organizations

NOTE Confidence: 0.848067492

00:26:24.944 --> 00:26:27.234 that don't have a robust.

NOTE Confidence: 0.848067492

00:26:27.240 --> 00:26:28.506 Integris management program.

NOTE Confidence: 0.848067492

00:26:28.506 --> 00:26:31.460 People are afraid to talk to their

NOTE Confidence: 0.848067492

00:26:31.529 --> 00:26:33.737 employers about their sleepiness,

NOTE Confidence: 0.848067492

00:26:33.740 --> 00:26:36.992 are afraid to ask for accommodations

NOTE Confidence: 0.848067492

00:26:36.992 --> 00:26:41.040 because there is a consequence to doing so.

NOTE Confidence: 0.848067492

00:26:41.040 --> 00:26:42.579 And so again,

NOTE Confidence: 0.848067492

00:26:42.579 --> 00:26:45.284 the best organizations actually not

NOTE Confidence: 0.848067492

00:26:45.284 --> 00:26:48.776 only don't punish people for reporting

NOTE Confidence: 0.848067492

00:26:48.776 --> 00:26:51.110 sleepiness that they don't report people

NOTE Confidence: 0.848067492

00:26:51.110 --> 00:26:52.860 for reporting inability to sleep,

NOTE Confidence: 0.848067492

00:26:52.860 --> 00:26:55.218 but they encourage reporting of that.

NOTE Confidence: 0.848067492

00:26:55.220 --> 00:26:57.248 And then finally on policies that.

NOTE Confidence: 0.848067492

00:26:57.250 --> 00:26:58.870 They all kind of measure use.

NOTE Confidence: 0.848067492

00:26:58.870 --> 00:27:01.830 I think every few weeks in the news we hear

NOTE Confidence: 0.848067492

00:27:01.902 --> 00:27:04.590 about a company that's banning napping,

NOTE Confidence: 0.848067492

00:27:04.590 --> 00:27:05.589 you know, well,

NOTE Confidence: 0.848067492

00:27:05.589 --> 00:27:08.403 I'm not sure that that's always the the

NOTE Confidence: 0.848067492

00:27:08.403 --> 00:27:10.869 healthiest policy with respect to sleep.

NOTE Confidence: 0.848067492

00:27:10.870 --> 00:27:12.142 You know, it really depends on

NOTE Confidence: 0.848067492

00:27:12.142 --> 00:27:13.610 the nature of the organization.

NOTE Confidence: 0.848067492

00:27:13.610 --> 00:27:16.130 There may be some situations where

NOTE Confidence: 0.848067492

00:27:16.130 --> 00:27:17.810 napping is entirely inappropriate,

NOTE Confidence: 0.848067492

00:27:17.810 --> 00:27:21.170 but for many organizations with 24 hour work,

NOTE Confidence: 0.848067492

00:27:21.170 --> 00:27:24.308 napping actually can be a very

NOTE Confidence: 0.848067492

00:27:24.308 --> 00:27:25.354 effective countermeasure.

NOTE Confidence: 0.848067492

00:27:25.360 --> 00:27:27.595 Education and training is another

NOTE Confidence: 0.848067492

00:27:27.595 --> 00:27:28.936 institutional touch point.

NOTE Confidence: 0.848067492

00:27:28.940 --> 00:27:32.475 So you know, I mentioned this previously,

NOTE Confidence: 0.848067492

00:27:32.480 --> 00:27:33.914 but you know,

NOTE Confidence: 0.848067492

00:27:33.914 --> 00:27:37.260 people do not get a whole lot

NOTE Confidence: 0.848067492

00:27:37.376 --> 00:27:39.488 of education about.

NOTE Confidence: 0.848067492

00:27:39.490 --> 00:27:41.800 Sleep or circadian rhythms and they

NOTE Confidence: 0.848067492

00:27:41.800 --> 00:27:44.635 get a lot of poor information online

NOTE Confidence: 0.848067492

00:27:44.635 --> 00:27:48.397 you know and so a you know the best

NOTE Confidence: 0.848067492

00:27:48.397 --> 00:27:50.567 company is the best institutions

NOTE Confidence: 0.848067492

00:27:50.567 --> 00:27:53.286 are going to provide modules on how

NOTE Confidence: 0.848067492

00:27:53.286 --> 00:27:55.914 people can manage their on the job

NOTE Confidence: 0.848067492

00:27:55.914 --> 00:27:58.482 sleepiness and you know this education

NOTE Confidence: 0.848067492

00:27:58.482 --> 00:28:00.775 and screening ideally includes you

NOTE Confidence: 0.848067492

00:28:00.775 --> 00:28:03.115 know sleep disorders screening with.

NOTE Confidence: 0.848067492

00:28:03.120 --> 00:28:05.600 Recommendations for following up

NOTE Confidence: 0.848067492

00:28:05.600 --> 00:28:08.700 with personal doctors as needed.

NOTE Confidence: 0.848067492

00:28:08.700 --> 00:28:10.312 This education should include

NOTE Confidence: 0.848067492

00:28:10.312 --> 00:28:11.924 how to use fatigue,

NOTE Confidence: 0.848067492

00:28:11.930 --> 00:28:13.064 countermeasures appropriately,

NOTE Confidence: 0.848067492

00:28:13.064 --> 00:28:15.899 how to manage difficult schedules.

NOTE Confidence: 0.848067492

00:28:15.900 --> 00:28:17.664 So again, this is a situation

NOTE Confidence: 0.848067492

00:28:17.664 --> 00:28:19.420 where in the aviation industry,

NOTE Confidence: 0.848067492

00:28:19.420 --> 00:28:21.358 we do this all the time.

NOTE Confidence: 0.848067492

00:28:21.360 --> 00:28:23.901 We have flights that are 19 hours

NOTE Confidence: 0.848067492

00:28:23.901 --> 00:28:26.768 long and we have 4 pilots who

NOTE Confidence: 0.848067492

00:28:26.768 --> 00:28:28.878 are flying on those aircraft.

NOTE Confidence: 0.848067492

00:28:28.880 --> 00:28:30.360 And so we, you know,

NOTE Confidence: 0.848067492

00:28:30.360 --> 00:28:32.145 can develop strategies for when

NOTE Confidence: 0.848067492

00:28:32.145 --> 00:28:33.930 and how people should rest.

NOTE Confidence: 0.848067492

00:28:33.930 --> 00:28:36.205 In order to make sure that the

NOTE Confidence: 0.848067492

00:28:36.205 --> 00:28:38.611 pilot crews are as loud as they

NOTE Confidence: 0.848067492

00:28:38.611 --> 00:28:40.645 can be during the entire flight.

NOTE Confidence: 0.848067492

00:28:40.650 --> 00:28:43.314 And then of course you can't

NOTE Confidence: 0.848067492

00:28:43.314 --> 00:28:44.646 just educate your,

NOTE Confidence: 0.848067492

00:28:44.650 --> 00:28:45.224 you know,

NOTE Confidence: 0.848067492

00:28:45.224 --> 00:28:46.946 your workforce at the lowest level.

NOTE Confidence: 0.848067492

00:28:46.950 --> 00:28:48.924 Management needs to be supportive as well,

NOTE Confidence: 0.848067492

00:28:48.930 --> 00:28:51.744 and so education and training should

NOTE Confidence: 0.848067492

00:28:51.744 --> 00:28:53.620 really also include management.

NOTE Confidence: 0.848067492

00:28:53.620 --> 00:28:56.010 And then infrastructure of course

NOTE Confidence: 0.848067492

00:28:56.010 --> 00:28:58.400 is something that's required for

NOTE Confidence: 0.848067492

00:28:58.474 --> 00:29:01.298 implementation of many countermeasures.

NOTE Confidence: 0.848067492

00:29:01.300 --> 00:29:02.080 And you know,

NOTE Confidence: 0.848067492

00:29:02.080 --> 00:29:03.640 if you are allow napping but

NOTE Confidence: 0.848067492

00:29:03.640 --> 00:29:05.399 have nowhere for people to nap,

NOTE Confidence: 0.848067492

00:29:05.400 --> 00:29:07.738 that's not going to be very useful.

NOTE Confidence: 0.848067492

00:29:07.740 --> 00:29:10.708 Light can be a very powerful countermeasure,

NOTE Confidence: 0.848067492

00:29:10.710 --> 00:29:13.300 but it may be very difficult for

NOTE Confidence: 0.848067492

00:29:13.300 --> 00:29:15.322 people to enhance their light

NOTE Confidence: 0.848067492

00:29:15.322 --> 00:29:16.998 exposure on their own.

NOTE Confidence: 0.848067492

00:29:17.000 --> 00:29:18.990 But changing the lighting systems

NOTE Confidence: 0.848067492

00:29:18.990 --> 00:29:21.387 within an environment can be a

NOTE Confidence: 0.848067492

00:29:21.387 --> 00:29:23.097 very effective way to promote.

NOTE Confidence: 0.848067492

00:29:23.100 --> 00:29:24.715 Partners in performance and there

NOTE Confidence: 0.848067492

00:29:24.715 --> 00:29:26.330 have been several studies that

NOTE Confidence: 0.848067492

00:29:26.380 --> 00:29:28.192 have shown that just changing the

NOTE Confidence: 0.848067492

00:29:28.192 --> 00:29:32.250 lighting in a 24 hour operation is

NOTE Confidence: 0.848067492

00:29:32.250 --> 00:29:34.915 very helpful in enhancing workers

NOTE Confidence: 0.848067492

00:29:34.915 --> 00:29:38.410 ability to stay alert on the job.

NOTE Confidence: 0.848067492

00:29:38.410 --> 00:29:40.654 And then we know that fatigue

NOTE Confidence: 0.848067492

00:29:40.654 --> 00:29:42.150 will never be eliminated.

NOTE Confidence: 0.916861310714286

00:29:42.150 --> 00:29:43.830 You know fatigue is something that

NOTE Confidence: 0.916861310714286

00:29:43.830 --> 00:29:46.087 goes hand in hand with 24 hour shifts.

NOTE Confidence: 0.916861310714286

00:29:46.090 --> 00:29:48.967 We're never going to be able to

NOTE Confidence: 0.916861310714286

00:29:48.967 --> 00:29:51.392 perfectly help people work at night

NOTE Confidence: 0.916861310714286

00:29:51.392 --> 00:29:53.612 as they would during the day.

NOTE Confidence: 0.916861310714286

00:29:53.620 --> 00:29:56.980 And so we need safety measures in place

NOTE Confidence: 0.916861310714286

00:29:56.980 --> 00:29:59.166 specifically for safety sensitive

NOTE Confidence: 0.916861310714286

00:29:59.166 --> 00:30:01.964 occupations that include, you know,

NOTE Confidence: 0.916861310714286

00:30:01.964 --> 00:30:05.128 clear systems for handing off work and

NOTE Confidence: 0.916861310714286

00:30:05.128 --> 00:30:08.179 cross checking shift changes happen.

NOTE Confidence: 0.916861310714286

00:30:08.180 --> 00:30:11.678 And finally on the institutional side,

NOTE Confidence: 0.916861310714286

00:30:11.680 --> 00:30:12.025 scheduling.

NOTE Confidence: 0.916861310714286

00:30:12.025 --> 00:30:14.862 So this is really the big, the big,

NOTE Confidence: 0.916861310714286

00:30:14.862 --> 00:30:17.148 you know, elephant in the room.

NOTE Confidence: 0.916861310714286

00:30:17.150 --> 00:30:20.197 This can make or break an individual's

NOTE Confidence: 0.916861310714286

00:30:20.197 --> 00:30:22.339 ability to cope with shift work

NOTE Confidence: 0.916861310714286

00:30:22.340 --> 00:30:24.746 and the lion share of scheduling

NOTE Confidence: 0.916861310714286

00:30:24.746 --> 00:30:26.836 decisions are happening on the

NOTE Confidence: 0.916861310714286

00:30:26.836 --> 00:30:28.876 institutional side of the fence.

NOTE Confidence: 0.916861310714286

00:30:28.880 --> 00:30:31.000 And so, you know,

NOTE Confidence: 0.916861310714286

00:30:31.000 --> 00:30:34.002 in optimizing schedule design, you know,

NOTE Confidence: 0.916861310714286

00:30:34.002 --> 00:30:36.207 institutions should again maybe be

NOTE Confidence: 0.916861310714286

00:30:36.207 --> 00:30:38.050 using those mathematical models.

NOTE Confidence: 0.916861310714286

00:30:38.050 --> 00:30:39.214 But, you know,

NOTE Confidence: 0.916861310714286

00:30:39.214 --> 00:30:41.542 not over scheduling people or when

NOTE Confidence: 0.916861310714286

00:30:41.542 --> 00:30:43.898 people do need to be scheduled

NOTE Confidence: 0.916861310714286

00:30:43.898 --> 00:30:45.410 for extended duty shifts,

NOTE Confidence: 0.916861310714286

00:30:45.410 --> 00:30:47.880 allowing protected time for sleep

NOTE Confidence: 0.916861310714286

00:30:47.880 --> 00:30:49.856 afterwards and recovery before

NOTE Confidence: 0.916861310714286

00:30:49.856 --> 00:30:51.230 bringing people back.

NOTE Confidence: 0.916861310714286

00:30:51.230 --> 00:30:53.485 And then in this circadian

NOTE Confidence: 0.916861310714286

00:30:53.485 --> 00:30:55.370 friendly length is, you know,

NOTE Confidence: 0.916861310714286

00:30:55.370 --> 00:30:56.960 if you're if you have people

NOTE Confidence: 0.916861310714286

00:30:56.960 --> 00:30:57.490 working overnight,

NOTE Confidence: 0.916861310714286

00:30:57.490 --> 00:30:59.362 you probably want shorter shifts than

NOTE Confidence: 0.916861310714286

00:30:59.362 --> 00:31:01.069 if you're working during the day,

NOTE Confidence: 0.916861310714286

00:31:01.070 --> 00:31:03.968 rotating shifts later rather than earlier.

NOTE Confidence: 0.916861310714286

00:31:03.970 --> 00:31:06.594 You know this has been something

NOTE Confidence: 0.916861310714286

00:31:06.594 --> 00:31:08.166 that has been.

NOTE Confidence: 0.916861310714286

00:31:08.166 --> 00:31:10.823 Known since the 1980s that humans

NOTE Confidence: 0.916861310714286

00:31:10.823 --> 00:31:12.628 do better in shifting later

NOTE Confidence: 0.916861310714286

00:31:12.628 --> 00:31:13.840 with rotating shifts.

NOTE Confidence: 0.916861310714286

00:31:13.840 --> 00:31:16.300 Yet we still see shift schedules,

NOTE Confidence: 0.916861310714286

00:31:16.300 --> 00:31:16.974 for example,

NOTE Confidence: 0.916861310714286

00:31:16.974 --> 00:31:18.996 for nurses that are shifting earlier

NOTE Confidence: 0.916861310714286

00:31:18.996 --> 00:31:20.899 that are starting at 3:00 AM.

NOTE Confidence: 0.916861310714286

00:31:20.900 --> 00:31:23.060 That doesn't make a whole lot of sense

NOTE Confidence: 0.916861310714286

00:31:23.060 --> 00:31:25.438 from the sleep and circadian standpoint.

NOTE Confidence: 0.916861310714286

00:31:25.440 --> 00:31:27.845 Minimizing the number of consecutive

NOTE Confidence: 0.916861310714286

00:31:27.845 --> 00:31:31.083 night shifts has been shown to be

NOTE Confidence: 0.916861310714286

00:31:31.083 --> 00:31:32.672 important countermeasure against fatigue,

NOTE Confidence: 0.916861310714286

00:31:32.672 --> 00:31:35.500 and then of course allowing time off

NOTE Confidence: 0.916861310714286

00:31:35.560 --> 00:31:37.640 between shifts for recovery really,

NOTE Confidence: 0.916861310714286

00:31:37.640 --> 00:31:39.860 no matter what type of shift

NOTE Confidence: 0.916861310714286

00:31:39.860 --> 00:31:41.340 a person is doing.

NOTE Confidence: 0.916861310714286

00:31:41.340 --> 00:31:45.148 So everything that I've talked about so far.

NOTE Confidence: 0.916861310714286

00:31:45.150 --> 00:31:46.434 Probably feels like things

NOTE Confidence: 0.916861310714286

00:31:46.434 --> 00:31:48.039 that are outside your control,

NOTE Confidence: 0.916861310714286

00:31:48.040 --> 00:31:51.380 particularly if you're a clinician.

NOTE Confidence: 0.916861310714286

00:31:51.380 --> 00:31:52.100 You know,

NOTE Confidence: 0.916861310714286

00:31:52.100 --> 00:31:53.900 there may be opportunities to

NOTE Confidence: 0.916861310714286

00:31:53.900 --> 00:31:56.556 do research or work with larger

NOTE Confidence: 0.916861310714286

00:31:56.556 --> 00:31:58.568 organizations to implement fatigue

NOTE Confidence: 0.916861310714286

00:31:58.568 --> 00:31:59.574 risk management,

NOTE Confidence: 0.916861310714286

00:31:59.580 --> 00:32:01.518 and if you have those connections,

NOTE Confidence: 0.916861310714286

00:32:01.520 --> 00:32:05.517 I would, you know, strongly encourage that.

NOTE Confidence: 0.916861310714286

00:32:05.520 --> 00:32:08.208 But probably more useful are the

NOTE Confidence: 0.916861310714286

00:32:08.208 --> 00:32:09.552 individual countermeasures that

NOTE Confidence: 0.916861310714286

00:32:09.552 --> 00:32:12.301 people can use to manage sleep loss

NOTE Confidence: 0.916861310714286

00:32:12.301 --> 00:32:14.459 and circadian misalignment and with

NOTE Confidence: 0.916861310714286

00:32:14.459 --> 00:32:16.259 these individual countermeasures.

NOTE Confidence: 0.916861310714286

00:32:16.260 --> 00:32:18.801 I really think of them as proactive

NOTE Confidence: 0.916861310714286

00:32:18.801 --> 00:32:20.860 countermeasures and reactive countermeasures.

NOTE Confidence: 0.916861310714286

00:32:20.860 --> 00:32:24.380 And there is some overlap between these just,

NOTE Confidence: 0.916861310714286

00:32:24.380 --> 00:32:26.515 you know, there there has to be.

NOTE Confidence: 0.916861310714286

00:32:26.520 --> 00:32:28.896 But I'm going to try to divide them

NOTE Confidence: 0.916861310714286

00:32:28.896 --> 00:32:31.518 up in these two buckets to begin.

NOTE Confidence: 0.916861310714286

00:32:31.520 --> 00:32:34.285 So we'll start with proactive

NOTE Confidence: 0.916861310714286

00:32:34.285 --> 00:32:35.707 countermeasures so, you know,

NOTE Confidence: 0.916861310714286

00:32:35.707 --> 00:32:37.152 feels a little funny putting

NOTE Confidence: 0.916861310714286

00:32:37.152 --> 00:32:38.240 us sleep hygiene,

NOTE Confidence: 0.916861310714286

00:32:38.240 --> 00:32:41.180 slide up to a Sleep Medicine group.

NOTE Confidence: 0.916861310714286

00:32:41.180 --> 00:32:41.486 We,

NOTE Confidence: 0.916861310714286

00:32:41.486 --> 00:32:42.710 I'm sure you know,

NOTE Confidence: 0.916861310714286

00:32:42.710 --> 00:32:44.954 every single person here talks about

NOTE Confidence: 0.916861310714286

00:32:44.954 --> 00:32:46.740 sleep hygiene probably every day.

NOTE Confidence: 0.916861310714286

00:32:46.740 --> 00:32:48.748 But I do want to highlight that there

NOTE Confidence: 0.916861310714286

00:32:48.748 --> 00:32:50.921 are some aspects of sleep hygiene that

NOTE Confidence: 0.916861310714286

00:32:50.921 --> 00:32:53.360 can be really challenging for shift workers.

NOTE Confidence: 0.916861310714286

00:32:53.360 --> 00:32:54.593 And having conversations

NOTE Confidence: 0.916861310714286

00:32:54.593 --> 00:32:56.237 about these specific issues,

NOTE Confidence: 0.916861310714286

00:32:56.240 --> 00:32:58.608 I think can go a long way in

NOTE Confidence: 0.916861310714286

00:32:58.608 --> 00:33:00.540 helping shift workers to manage.

NOTE Confidence: 0.916861310714286

00:33:00.540 --> 00:33:02.750 So optimizing the sleep environment,

NOTE Confidence: 0.916861310714286

00:33:02.750 --> 00:33:04.990 there have been several studies

NOTE Confidence: 0.916861310714286

00:33:04.990 --> 00:33:07.230 that have demonstrated that having

NOTE Confidence: 0.840375368275862

00:33:07.304 --> 00:33:09.368 blackout shades for daytime

NOTE Confidence: 0.840375368275862

00:33:09.368 --> 00:33:11.432 sleepiness is critically important

NOTE Confidence: 0.840375368275862

00:33:11.432 --> 00:33:13.738 in increasing the duration and

NOTE Confidence: 0.840375368275862

00:33:13.738 --> 00:33:16.138 quality of sleep that people obtain,

NOTE Confidence: 0.840375368275862

00:33:16.140 --> 00:33:17.400 you know, as with other.

NOTE Confidence: 0.840375368275862

00:33:17.400 --> 00:33:20.718 Best practices like turning off your phone.

NOTE Confidence: 0.840375368275862

00:33:20.720 --> 00:33:23.233 You know you're more likely to get

NOTE Confidence: 0.840375368275862

00:33:23.233 --> 00:33:25.439 more phone calls during the day.

NOTE Confidence: 0.840375368275862

00:33:25.440 --> 00:33:27.708 Making the environment quiet and cool.

NOTE Confidence: 0.840375368275862

00:33:27.710 --> 00:33:29.047 All of the things that we would

NOTE Confidence: 0.840375368275862

00:33:29.047 --> 00:33:29.880 normally recommend at night,

NOTE Confidence: 0.840375368275862

00:33:29.880 --> 00:33:31.782 but that are typically easier to

NOTE Confidence: 0.840375368275862

00:33:31.782 --> 00:33:33.988 achieve at night than during the day.

NOTE Confidence: 0.840375368275862

00:33:33.990 --> 00:33:37.175 Regular sleep wake timing is very difficult,

NOTE Confidence: 0.840375368275862

00:33:37.180 --> 00:33:38.860 if not impossible for shift

NOTE Confidence: 0.840375368275862

00:33:38.860 --> 00:33:39.868 workers to achieve.

NOTE Confidence: 0.840375368275862

00:33:39.870 --> 00:33:42.214 And so I think that sometimes when shift

NOTE Confidence: 0.840375368275862

00:33:42.214 --> 00:33:44.488 workers see sleep hygiene guide guidance,

NOTE Confidence: 0.840375368275862

00:33:44.490 --> 00:33:48.130 they quickly dismiss above it because they

NOTE Confidence: 0.840375368275862

00:33:48.130 --> 00:33:50.450 see recommendations they can't achieve.

NOTE Confidence: 0.840375368275862

00:33:50.450 --> 00:33:54.199 But there have been some really nice studies

NOTE Confidence: 0.840375368275862

00:33:54.199 --> 00:33:56.644 showing that maintaining a compromise.

NOTE Confidence: 0.840375368275862

00:33:56.650 --> 00:33:59.368 Day shift between your day schedule

NOTE Confidence: 0.840375368275862

00:33:59.368 --> 00:34:02.025 and night schedule can actually be

NOTE Confidence: 0.840375368275862

00:34:02.025 --> 00:34:04.699 a way for shift workers to cope,

NOTE Confidence: 0.840375368275862

00:34:04.700 --> 00:34:07.844 and so maybe if a person is a

NOTE Confidence: 0.840375368275862

00:34:07.844 --> 00:34:10.676 night worker and then they revert

NOTE Confidence: 0.840375368275862

00:34:10.676 --> 00:34:13.598 to day's during their days off,

NOTE Confidence: 0.840375368275862

00:34:13.600 --> 00:34:17.122 maybe they're keeping a very late

NOTE Confidence: 0.840375368275862

00:34:17.122 --> 00:34:19.470 shifted sleep wake schedule.

NOTE Confidence: 0.840375368275862

00:34:19.470 --> 00:34:21.022 During their days off,

NOTE Confidence: 0.840375368275862

00:34:21.022 --> 00:34:24.189 so that they're going to bed very late,

NOTE Confidence: 0.840375368275862

00:34:24.190 --> 00:34:27.557 maybe sleeping in much later than a

NOTE Confidence: 0.840375368275862

00:34:27.557 --> 00:34:30.196 typical lifetime would be in order

NOTE Confidence: 0.840375368275862

00:34:30.196 --> 00:34:32.881 to avoid that giant swing in their

NOTE Confidence: 0.840375368275862

00:34:32.881 --> 00:34:35.236 circadian time or not massive.

NOTE Confidence: 0.840375368275862

00:34:35.240 --> 00:34:36.312 Their circadian rhythm probably

NOTE Confidence: 0.840375368275862

00:34:36.312 --> 00:34:37.384 isn't shifting very much,

NOTE Confidence: 0.840375368275862

00:34:37.390 --> 00:34:39.378 but to avoid that big swing in

NOTE Confidence: 0.840375368275862

00:34:39.378 --> 00:34:41.108 their sleep timing relative to

NOTE Confidence: 0.840375368275862

00:34:41.108 --> 00:34:42.326 their circadian rhythm.

NOTE Confidence: 0.840375368275862

00:34:42.330 --> 00:34:44.715 So while shift worker may not be able to

NOTE Confidence: 0.840375368275862

00:34:44.715 --> 00:34:46.609 maintain regular sleep and wake times,

NOTE Confidence: 0.840375368275862

00:34:46.610 --> 00:34:48.334 there are some strategies

NOTE Confidence: 0.840375368275862

00:34:48.334 --> 00:34:49.627 for compromises again.

NOTE Confidence: 0.840375368275862

00:34:49.630 --> 00:34:52.606 It depends on the nature of the work,

NOTE Confidence: 0.840375368275862

00:34:52.610 --> 00:34:55.508 but there can be ways around this.

NOTE Confidence: 0.840375368275862

00:34:55.510 --> 00:34:57.556 Avoiding bright light before bed is

NOTE Confidence: 0.840375368275862

00:34:57.556 --> 00:34:59.721 another one that's really hard for

NOTE Confidence: 0.840375368275862

00:34:59.721 --> 00:35:01.197 particularly night shift workers

NOTE Confidence: 0.840375368275862

00:35:01.197 --> 00:35:03.060 because most night shift workers

NOTE Confidence: 0.840375368275862

00:35:03.060 --> 00:35:04.998 or many night shift workers are

NOTE Confidence: 0.840375368275862

00:35:04.998 --> 00:35:06.766 driving home in the light.

NOTE Confidence: 0.840375368275862

00:35:06.766 --> 00:35:08.254 And I personally wouldn't

NOTE Confidence: 0.840375368275862

00:35:08.254 --> 00:35:09.370 recommend using sunglasses.

NOTE Confidence: 0.840375368275862

00:35:09.370 --> 00:35:10.800 I know some people do.

NOTE Confidence: 0.840375368275862

00:35:10.800 --> 00:35:12.690 I think that that's a safety risk.

NOTE Confidence: 0.840375368275862

00:35:12.690 --> 00:35:15.266 You know you want the the bright light

NOTE Confidence: 0.840375368275862

00:35:15.266 --> 00:35:17.883 to help someone you know stay alert

NOTE Confidence: 0.840375368275862

00:35:17.883 --> 00:35:20.760 during their drive home so that they're.

NOTE Confidence: 0.840375368275862

00:35:20.760 --> 00:35:23.160 Getting that benefit of the countermeasure.

NOTE Confidence: 0.840375368275862

00:35:23.160 --> 00:35:24.905 But that's going to potentially

NOTE Confidence: 0.840375368275862

00:35:24.905 --> 00:35:27.046 have an acute alerting effect that

NOTE Confidence: 0.840375368275862

00:35:27.046 --> 00:35:29.056 will inhibit one's ability to sleep.

NOTE Confidence: 0.840375368275862

00:35:29.060 --> 00:35:30.290 And so perhaps,

NOTE Confidence: 0.840375368275862

00:35:30.290 --> 00:35:32.750 maybe we're talking about having a

NOTE Confidence: 0.840375368275862

00:35:32.750 --> 00:35:35.900 longer line downtime before trying to sleep,

NOTE Confidence: 0.840375368275862

00:35:35.900 --> 00:35:37.450 after being exposed to bright

NOTE Confidence: 0.840375368275862

00:35:37.450 --> 00:35:38.380 sun before sleep.

NOTE Confidence: 0.840375368275862

00:35:38.380 --> 00:35:41.492 Or maybe we're talking about taking

NOTE Confidence: 0.840375368275862

00:35:41.492 --> 00:35:43.352 public transportation home and wearing

NOTE Confidence: 0.840375368275862

00:35:43.352 --> 00:35:45.443 sunglasses so that you can minimize

NOTE Confidence: 0.840375368275862

00:35:45.443 --> 00:35:47.354 that blue light on the way home.

NOTE Confidence: 0.840375368275862

00:35:47.360 --> 00:35:48.046 So again,

NOTE Confidence: 0.840375368275862

00:35:48.046 --> 00:35:50.447 it's working with people to make sure.

NOTE Confidence: 0.840375368275862

00:35:50.450 --> 00:35:52.635 That the recommendations meet them

NOTE Confidence: 0.840375368275862

00:35:52.635 --> 00:35:55.975 where they are in their workspace and

NOTE Confidence: 0.840375368275862

00:35:55.975 --> 00:35:58.665 then lastly just communicating with.

NOTE Confidence: 0.840375368275862

00:35:58.670 --> 00:35:59.333 Family,

NOTE Confidence: 0.840375368275862

00:35:59.333 --> 00:36:01.985 household neighbors on one's

NOTE Confidence: 0.840375368275862

00:36:01.985 --> 00:36:04.637 work schedule with pilots.

NOTE Confidence: 0.840375368275862

00:36:04.640 --> 00:36:06.368 We often have them put in a note

NOTE Confidence: 0.840375368275862

00:36:06.368 --> 00:36:08.305 on their hotel room door indicating

NOTE Confidence: 0.840375368275862

00:36:08.305 --> 00:36:10.120 that they're sleeping so that

NOTE Confidence: 0.840375368275862

00:36:10.120 --> 00:36:11.910 housekeeping doesn't knock on the door.

NOTE Confidence: 0.840375368275862

00:36:11.910 --> 00:36:14.045 You know, just little things like that,

NOTE Confidence: 0.840375368275862

00:36:14.050 --> 00:36:15.998 which daytime workers probably

NOTE Confidence: 0.840375368275862

00:36:15.998 --> 00:36:17.946 don't have to do.

NOTE Confidence: 0.840375368275862

00:36:17.950 --> 00:36:19.978 They can make a big difference

NOTE Confidence: 0.840375368275862

00:36:19.978 --> 00:36:21.330 for night shift workers.

NOTE Confidence: 0.823570498

00:36:21.330 --> 00:36:23.370 Of course, shift work

NOTE Confidence: 0.823570498

00:36:23.370 --> 00:36:26.430 disorder is a big concern now.

NOTE Confidence: 0.823570498

00:36:26.430 --> 00:36:28.662 I am I I think you heard I'm on

NOTE Confidence: 0.823570498

00:36:28.662 --> 00:36:30.428 the extrinsic circadian sleep

NOTE Confidence: 0.823570498

00:36:30.428 --> 00:36:33.320 wake disorders task force for the

NOTE Confidence: 0.823570498

00:36:33.320 --> 00:36:35.749 American Academy of Sleep Medicine

NOTE Confidence: 0.823570498

00:36:35.749 --> 00:36:37.625 and Sleep Research society.

NOTE Confidence: 0.823570498

00:36:37.630 --> 00:36:41.004 And shift work disorder is one of

NOTE Confidence: 0.823570498

00:36:41.004 --> 00:36:44.556 the one of the disorders that we're

NOTE Confidence: 0.823570498

00:36:44.556 --> 00:36:47.074 examining to provide guidelines,

NOTE Confidence: 0.823570498

00:36:47.074 --> 00:36:49.000 clinical guidelines for

NOTE Confidence: 0.823570498

00:36:49.000 --> 00:36:51.360 recommendations in the future.

NOTE Confidence: 0.823570498

00:36:51.360 --> 00:36:54.624 And this has been a big struggle because

NOTE Confidence: 0.823570498

00:36:54.624 --> 00:36:57.585 in surveys that we've done and in looking

NOTE Confidence: 0.823570498

00:36:57.585 --> 00:36:59.415 at the literature from meta analysis,

NOTE Confidence: 0.823570498

00:36:59.420 --> 00:37:01.076 we actually find that there are

NOTE Confidence: 0.823570498

00:37:01.076 --> 00:37:03.382 not a whole lot of people diagnosed

NOTE Confidence: 0.823570498

00:37:03.382 --> 00:37:04.894 with shift work disorder.

NOTE Confidence: 0.823570498

00:37:04.900 --> 00:37:07.510 Studies sort of suggest that somewhere

NOTE Confidence: 0.823570498

00:37:07.510 --> 00:37:10.245 around 20% of shift workers may be

NOTE Confidence: 0.823570498

00:37:10.245 --> 00:37:13.360 at risk or have shift work disorder.

NOTE Confidence: 0.823570498

00:37:13.360 --> 00:37:15.061 But when we actually sort of pin

NOTE Confidence: 0.823570498

00:37:15.061 --> 00:37:16.798 down to those who are diagnosed,

NOTE Confidence: 0.823570498

00:37:16.800 --> 00:37:18.840 we're not finding very many people.

NOTE Confidence: 0.823570498

00:37:18.840 --> 00:37:21.710 And so I think screening not just.

NOTE Confidence: 0.823570498

00:37:21.710 --> 00:37:23.290 It's certainly screening for all

NOTE Confidence: 0.823570498

00:37:23.290 --> 00:37:24.554 sleep disorders is important,

NOTE Confidence: 0.823570498

00:37:24.560 --> 00:37:25.688 but for that,

NOTE Confidence: 0.823570498

00:37:25.688 --> 00:37:27.568 especially for shift work disorder,

NOTE Confidence: 0.823570498

00:37:27.570 --> 00:37:30.720 so that shift workers who are having

NOTE Confidence: 0.823570498

00:37:30.720 --> 00:37:33.227 great difficulty coping can get a

NOTE Confidence: 0.823570498

00:37:33.227 --> 00:37:35.387 health and treatment that they need

NOTE Confidence: 0.823570498

00:37:35.387 --> 00:37:38.299 to better adjust to these schedules.

NOTE Confidence: 0.823570498

00:37:38.300 --> 00:37:38.829 Um,

NOTE Confidence: 0.823570498

00:37:38.829 --> 00:37:42.003 napping again is a long standing

NOTE Confidence: 0.823570498

00:37:42.003 --> 00:37:44.740 countermeasure that I'm sure that

NOTE Confidence: 0.823570498

00:37:44.740 --> 00:37:47.112 you're already thinking about

NOTE Confidence: 0.823570498

00:37:47.112 --> 00:37:49.080 using and recommending.

NOTE Confidence: 0.823570498

00:37:49.080 --> 00:37:50.936 But I think of napping in a couple

NOTE Confidence: 0.823570498

00:37:50.936 --> 00:37:51.700 of different ways.

NOTE Confidence: 0.823570498

00:37:51.700 --> 00:37:53.140 So this is really,

NOTE Confidence: 0.823570498

00:37:53.140 --> 00:37:54.940 this is the prophylactic napping.

NOTE Confidence: 0.823570498

00:37:54.940 --> 00:37:56.396 This is recovery napping.

NOTE Confidence: 0.823570498

00:37:56.396 --> 00:37:58.580 This is napping outside of the

NOTE Confidence: 0.823570498

00:37:58.653 --> 00:37:59.759 work environment.

NOTE Confidence: 0.823570498

00:37:59.760 --> 00:38:03.009 And so when a person is shifting from a

NOTE Confidence: 0.823570498

00:38:03.009 --> 00:38:06.736 day type of shift to a night type of shift,

NOTE Confidence: 0.823570498

00:38:06.740 --> 00:38:09.724 recommending a nap at a strategic time maybe.

NOTE Confidence: 0.823570498

00:38:09.730 --> 00:38:11.270 Late afternoon before the

NOTE Confidence: 0.823570498

00:38:11.270 --> 00:38:12.425 Wake maintenance zone.

NOTE Confidence: 0.823570498

00:38:12.430 --> 00:38:13.060 You know,

NOTE Confidence: 0.823570498

00:38:13.060 --> 00:38:14.635 something that could help them

NOTE Confidence: 0.823570498

00:38:14.635 --> 00:38:16.549 better get through that night shift.

NOTE Confidence: 0.823570498

00:38:16.550 --> 00:38:19.450 And then for recovery sleep.

NOTE Confidence: 0.823570498

00:38:19.450 --> 00:38:21.300 Helping shift workers to understand

NOTE Confidence: 0.823570498

00:38:21.300 --> 00:38:23.591 when to time their sleep relative

NOTE Confidence: 0.823570498

00:38:23.591 --> 00:38:25.811 to what they're doing next can

NOTE Confidence: 0.823570498

00:38:25.811 --> 00:38:26.921 be really important.

NOTE Confidence: 0.823570498

00:38:26.930 --> 00:38:30.378 If a shift worker is again doing a

NOTE Confidence: 0.823570498

00:38:30.378 --> 00:38:33.769 night shift and then sleeping all day,

NOTE Confidence: 0.823570498

00:38:33.770 --> 00:38:36.368 but has the next day off,

NOTE Confidence: 0.823570498

00:38:36.370 --> 00:38:38.638 that actually might not make a lot of sense.

NOTE Confidence: 0.823570498

00:38:38.640 --> 00:38:40.272 Maybe it's better for them to

NOTE Confidence: 0.823570498

00:38:40.272 --> 00:38:41.360 take a shorter nap.

NOTE Confidence: 0.823570498

00:38:41.360 --> 00:38:43.481 Be awake for more of the day

NOTE Confidence: 0.823570498

00:38:43.481 --> 00:38:45.837 and then go to sleep at night.

NOTE Confidence: 0.823570498

00:38:45.840 --> 00:38:46.468 So again,

NOTE Confidence: 0.823570498

00:38:46.468 --> 00:38:48.980 it sort of depends on the circumstances here,

NOTE Confidence: 0.823570498

00:38:48.980 --> 00:38:50.580 but.

NOTE Confidence: 0.823570498

00:38:50.580 --> 00:38:52.956 There have been many studies that

NOTE Confidence: 0.823570498

00:38:52.956 --> 00:38:55.096 have demonstrated the benefit of

NOTE Confidence: 0.823570498

00:38:55.096 --> 00:38:58.480 NAPS in mitigating that on the

NOTE Confidence: 0.823570498

00:38:58.480 --> 00:39:01.380 job sleepiness that occurs and

NOTE Confidence: 0.823570498

00:39:01.380 --> 00:39:03.120 if done strategically.

NOTE Confidence: 0.823570498

00:39:03.120 --> 00:39:05.760 Napping can be a really powerful

NOTE Confidence: 0.823570498

00:39:05.760 --> 00:39:07.520 tool in this bed.

NOTE Confidence: 0.823570498

00:39:07.520 --> 00:39:10.094 Lighting is complicated,

NOTE Confidence: 0.823570498

00:39:10.094 --> 00:39:12.668 and so I.

NOTE Confidence: 0.823570498

00:39:12.670 --> 00:39:12.950 Prior,

NOTE Confidence: 0.823570498

00:39:12.950 --> 00:39:14.630 both prior to coming into NASA

NOTE Confidence: 0.823570498

00:39:14.630 --> 00:39:15.820 and now at NASA,

NOTE Confidence: 0.823570498

00:39:15.820 --> 00:39:18.349 I do a lot of work on using light

NOTE Confidence: 0.823570498

00:39:18.349 --> 00:39:20.620 as a countermeasure for the

NOTE Confidence: 0.823570498

00:39:20.620 --> 00:39:23.005 populations that we work with.

NOTE Confidence: 0.823570498

00:39:23.010 --> 00:39:24.750 Obviously bright blue and rich light,

NOTE Confidence: 0.823570498

00:39:24.750 --> 00:39:26.386 just the circadian rhythm.

NOTE Confidence: 0.823570498

00:39:26.386 --> 00:39:29.514 So if you have a maybe a

NOTE Confidence: 0.823570498

00:39:29.514 --> 00:39:31.269 nontraditional work shift,

NOTE Confidence: 0.823570498

00:39:31.270 --> 00:39:31.886 for example,

NOTE Confidence: 0.823570498

00:39:31.886 --> 00:39:33.734 we work with people who are

NOTE Confidence: 0.823570498

00:39:33.734 --> 00:39:35.589 living on Mars time on Earth,

NOTE Confidence: 0.823570498

00:39:35.590 --> 00:39:37.810 so they're shifting 39 minutes later,

NOTE Confidence: 0.823570498

00:39:37.810 --> 00:39:38.914 they're shifting their sleep

NOTE Confidence: 0.823570498

00:39:38.914 --> 00:39:40.018 schedule 39 minutes later.

NOTE Confidence: 0.823570498

00:39:40.020 --> 00:39:42.828 Every day we can give them blue light.

NOTE Confidence: 0.821609194666667

00:39:42.830 --> 00:39:44.876 Access to the shift their sleep

NOTE Confidence: 0.821609194666667

00:39:44.876 --> 00:39:46.906 so that they're getting that blue

NOTE Confidence: 0.821609194666667

00:39:46.906 --> 00:39:48.992 light pulse sort of just before bed

NOTE Confidence: 0.821609194666667

00:39:48.992 --> 00:39:51.365 on the phase delay portion of the

NOTE Confidence: 0.821609194666667

00:39:51.365 --> 00:39:53.482 phase response curve to shift their

NOTE Confidence: 0.821609194666667

00:39:53.482 --> 00:39:56.570 sleep to keep them as aligned as we

NOTE Confidence: 0.821609194666667

00:39:56.660 --> 00:39:59.866 possibly can to that weird Mars timing.

NOTE Confidence: 0.821609194666667

00:39:59.870 --> 00:40:01.514 And of course light also just

NOTE Confidence: 0.821609194666667

00:40:01.514 --> 00:40:03.010 makes you feel more alert,

NOTE Confidence: 0.821609194666667

00:40:03.010 --> 00:40:05.859 so if you're in a dark environment.

NOTE Confidence: 0.821609194666667

00:40:05.860 --> 00:40:07.442 You're going to feel sleepier than if

NOTE Confidence: 0.821609194666667

00:40:07.442 --> 00:40:09.278 you're in a very bright environment.

NOTE Confidence: 0.821609194666667

00:40:09.280 --> 00:40:11.434 So having shift workers just use

NOTE Confidence: 0.821609194666667

00:40:11.434 --> 00:40:13.653 bright light as an acute common

NOTE Confidence: 0.821609194666667

00:40:13.653 --> 00:40:15.765 measure can be very helpful and

NOTE Confidence: 0.821609194666667

00:40:15.765 --> 00:40:18.100 has a direct effect on mood.

NOTE Confidence: 0.821609194666667

00:40:18.100 --> 00:40:20.220 But it can be complicated if you have

NOTE Confidence: 0.821609194666667

00:40:20.220 --> 00:40:22.227 somebody who's shifting all over the place.

NOTE Confidence: 0.821609194666667

00:40:22.230 --> 00:40:22.916 For example,

NOTE Confidence: 0.821609194666667

00:40:22.916 --> 00:40:24.631 our astronaut population sometimes can't

NOTE Confidence: 0.821609194666667

00:40:24.631 --> 00:40:26.862 use light as a countermeasure because

NOTE Confidence: 0.821609194666667

00:40:26.862 --> 00:40:28.777 as we're building their schedules,

NOTE Confidence: 0.821609194666667

00:40:28.780 --> 00:40:31.356 we have to shift them so much to

NOTE Confidence: 0.821609194666667

00:40:31.356 --> 00:40:33.018 accommodate mission events that we

NOTE Confidence: 0.821609194666667

00:40:33.018 --> 00:40:35.620 could end up shifting them into a phase.

NOTE Confidence: 0.821609194666667

00:40:35.620 --> 00:40:38.070 Position that is not optimal for the

NOTE Confidence: 0.821609194666667

00:40:38.070 --> 00:40:40.938 work that they have to do in the future.

NOTE Confidence: 0.821609194666667

00:40:40.940 --> 00:40:43.621 And so in those cases maybe we're

NOTE Confidence: 0.821609194666667

00:40:43.621 --> 00:40:44.770 using other countermeasures.

NOTE Confidence: 0.821609194666667

00:40:44.770 --> 00:40:47.829 So the the I guess answer to

NOTE Confidence: 0.821609194666667

00:40:47.829 --> 00:40:50.709 light here is not that it's.

NOTE Confidence: 0.821609194666667

00:40:50.710 --> 00:40:51.998 Can be deployed adlab.

NOTE Confidence: 0.821609194666667

00:40:51.998 --> 00:40:53.608 It really should be deployed

NOTE Confidence: 0.821609194666667

00:40:53.608 --> 00:40:55.420 in a very controlled way based

NOTE Confidence: 0.821609194666667

00:40:55.420 --> 00:40:57.210 on the nature of the work.

NOTE Confidence: 0.533758568

00:40:59.230 --> 00:41:01.870 Hypnotics and chromatics. So disclaimer,

NOTE Confidence: 0.533758568

00:41:01.870 --> 00:41:05.244 I'm not a clinician and we're rarely,

NOTE Confidence: 0.533758568

00:41:05.250 --> 00:41:07.182 you know even within Tigris management

NOTE Confidence: 0.533758568

00:41:07.182 --> 00:41:09.883 where I work with flight surgeons were

NOTE Confidence: 0.533758568

00:41:09.883 --> 00:41:12.128 rarely recommending hypnotics and chronic

NOTE Confidence: 0.533758568

00:41:12.128 --> 00:41:14.266 biotics because we're trying to manage

NOTE Confidence: 0.533758568

00:41:14.266 --> 00:41:17.311 with many of the other tools that we have.

NOTE Confidence: 0.533758568

00:41:17.311 --> 00:41:19.446 But particularly for Hypnotics when

NOTE Confidence: 0.533758568

00:41:19.446 --> 00:41:21.528 we're talking about shift work,

NOTE Confidence: 0.533758568

00:41:21.530 --> 00:41:24.848 we're not, have not, we don't want,

NOTE Confidence: 0.533758568

00:41:24.850 --> 00:41:26.476 have not exceeded our first line

NOTE Confidence: 0.533758568

00:41:26.476 --> 00:41:27.905 of defense because we're not

NOTE Confidence: 0.533758568

00:41:27.905 --> 00:41:29.355 shifting this circadian rhythm and

NOTE Confidence: 0.533758568

00:41:29.355 --> 00:41:30.999 if we're really trying to shift.

NOTE Confidence: 0.533758568

00:41:31.000 --> 00:41:31.896 Circadian rhythm.

NOTE Confidence: 0.533758568

00:41:31.896 --> 00:41:34.584 If somebody says doing a couple

NOTE Confidence: 0.533758568

00:41:34.584 --> 00:41:36.649 of weeks of night work,

NOTE Confidence: 0.533758568

00:41:36.650 --> 00:41:38.890 say because they work on an oil rig,

NOTE Confidence: 0.533758568

00:41:38.890 --> 00:41:41.005 we might, we might actually

NOTE Confidence: 0.533758568

00:41:41.005 --> 00:41:42.697 recommend something like chronomatic,

NOTE Confidence: 0.533758568

00:41:42.700 --> 00:41:44.692 like melatonin to help them adjust

NOTE Confidence: 0.533758568

00:41:44.692 --> 00:41:47.089 to that state more stable schedule,

NOTE Confidence: 0.533758568

00:41:47.090 --> 00:41:49.075 rather than having flight surgeon

NOTE Confidence: 0.533758568

00:41:49.075 --> 00:41:51.060 prescribe a hypnotic because the

NOTE Confidence: 0.533758568

00:41:51.123 --> 00:41:53.349 hypnotic is going to make them sleep,

NOTE Confidence: 0.533758568

00:41:53.350 --> 00:41:54.960 it's not going to necessarily

NOTE Confidence: 0.533758568

00:41:54.960 --> 00:41:56.248 shift their circadian rhythm,

NOTE Confidence: 0.533758568

00:41:56.250 --> 00:41:57.750 although there may be some benefit

NOTE Confidence: 0.533758568

00:41:57.750 --> 00:41:59.626 to them not being exposed to light

NOTE Confidence: 0.533758568

00:41:59.626 --> 00:42:01.006 at the time they're sleeping.

NOTE Confidence: 0.533758568

00:42:01.010 --> 00:42:02.862 It's really, really complicated,

NOTE Confidence: 0.533758568

00:42:02.862 --> 00:42:05.177 but largely we're really focusing

NOTE Confidence: 0.533758568

00:42:05.177 --> 00:42:07.630 on the other aspects of fatigue

NOTE Confidence: 0.533758568

00:42:07.630 --> 00:42:09.545 risk management and with the

NOTE Confidence: 0.533758568

00:42:09.613 --> 00:42:11.359 availability of melatonin,

NOTE Confidence: 0.533758568

00:42:11.360 --> 00:42:14.430 so many people just self

NOTE Confidence: 0.533758568

00:42:14.430 --> 00:42:15.658 administer melatonin,

NOTE Confidence: 0.533758568

00:42:15.660 --> 00:42:18.208 try to be very careful and cautious

NOTE Confidence: 0.533758568

00:42:18.208 --> 00:42:21.168 in our education to the general shift

NOTE Confidence: 0.533758568

00:42:21.168 --> 00:42:23.408 working workforce about not using

NOTE Confidence: 0.533758568

00:42:23.408 --> 00:42:25.613 melatonin because they have the

NOTE Confidence: 0.533758568

00:42:25.613 --> 00:42:27.713 potential to use it inappropriately

NOTE Confidence: 0.533758568

00:42:27.713 --> 00:42:29.904 or to make themselves more

NOTE Confidence: 0.533758568

00:42:29.904 --> 00:42:32.109 misaligned with that self selected.

NOTE Confidence: 0.533758568

00:42:32.110 --> 00:42:34.000 Use.

NOTE Confidence: 0.533758568

00:42:34.000 --> 00:42:35.560 And then finally,

NOTE Confidence: 0.533758568

00:42:35.560 --> 00:42:38.160 I'm an individual countermeasures personal

NOTE Confidence: 0.533758568

00:42:38.160 --> 00:42:40.426 scheduling can be a target as well,

NOTE Confidence: 0.533758568

00:42:40.430 --> 00:42:41.624 so sometimes.

NOTE Confidence: 0.533758568

00:42:41.624 --> 00:42:47.120 People have a tendency to try to job cram.

NOTE Confidence: 0.533758568

00:42:47.120 --> 00:42:49.300 They want more days off,

NOTE Confidence: 0.533758568

00:42:49.300 --> 00:42:51.631 so they'll try to get more work

NOTE Confidence: 0.533758568

00:42:51.631 --> 00:42:53.800 into a shorter number of days,

NOTE Confidence: 0.533758568

00:42:53.800 --> 00:42:55.176 and that doesn't necessarily

NOTE Confidence: 0.533758568

00:42:55.176 --> 00:42:57.240 align with what's best for their

NOTE Confidence: 0.533758568

00:42:57.305 --> 00:42:59.340 alertness and performance and sleep.

NOTE Confidence: 0.533758568

00:42:59.340 --> 00:43:02.376 And so having a conversation about

NOTE Confidence: 0.533758568

00:43:02.376 --> 00:43:04.835 how the time off will be affected

NOTE Confidence: 0.533758568

00:43:04.835 --> 00:43:07.606 by that type of job cramming can be

NOTE Confidence: 0.533758568

00:43:07.606 --> 00:43:09.696 really valuable in helping people

NOTE Confidence: 0.533758568

00:43:09.696 --> 00:43:11.885 understand that maybe it's better to

NOTE Confidence: 0.533758568

00:43:11.885 --> 00:43:14.388 spread out shifts so that you can get.

NOTE Confidence: 0.533758568

00:43:14.388 --> 00:43:16.376 Better sleep so that you can be

NOTE Confidence: 0.533758568

00:43:16.376 --> 00:43:18.340 more alert and engaged with your

NOTE Confidence: 0.533758568

00:43:18.340 --> 00:43:20.624 family on your days off and more

NOTE Confidence: 0.533758568

00:43:20.624 --> 00:43:22.738 alert and rested in going to work.

NOTE Confidence: 0.533758568

00:43:22.740 --> 00:43:25.218 And then there are some situations

NOTE Confidence: 0.533758568

00:43:25.218 --> 00:43:27.399 where individuals can choose to say,

NOTE Confidence: 0.533758568

00:43:27.400 --> 00:43:31.929 take more early starts or late finishes.

NOTE Confidence: 0.533758568

00:43:31.930 --> 00:43:33.785 Which may be better aligned

NOTE Confidence: 0.533758568

00:43:33.785 --> 00:43:34.898 with their chronotype.

NOTE Confidence: 0.533758568

00:43:34.900 --> 00:43:37.050 That should also be encouraged,

NOTE Confidence: 0.533758568

00:43:37.050 --> 00:43:40.660 and we do that in my work all the time.

NOTE Confidence: 0.533758568

00:43:40.660 --> 00:43:44.098 So shifting now to reactive countermeasures.

NOTE Confidence: 0.533758568

00:43:44.100 --> 00:43:45.855 Caffeine, of course,

NOTE Confidence: 0.533758568

00:43:45.855 --> 00:43:48.700 is probably the most common

NOTE Confidence: 0.533758568

00:43:48.700 --> 00:43:49.700 reactive countermeasure.

NOTE Confidence: 0.533758568

00:43:49.700 --> 00:43:53.200 So these are on the job countermeasures

NOTE Confidence: 0.533758568

00:43:53.279 --> 00:43:55.960 that one can use to combat sleepiness.

NOTE Confidence: 0.533758568

00:43:55.960 --> 00:43:58.128 And I think the big problem with caffeine,

NOTE Confidence: 0.533758568

00:43:58.130 --> 00:43:58.964 like with melatonin,

NOTE Confidence: 0.533758568

00:43:58.964 --> 00:44:01.200 people can just grab it whenever they want,

NOTE Confidence: 0.533758568

00:44:01.200 --> 00:44:03.425 and many people don't understand

NOTE Confidence: 0.533758568

00:44:03.425 --> 00:44:05.650 how to use caffeine effectively.

NOTE Confidence: 0.533758568

00:44:05.650 --> 00:44:07.786 So little and often is the

NOTE Confidence: 0.533758568

00:44:07.786 --> 00:44:08.498 best recommendation,

NOTE Confidence: 0.533758568

00:44:08.500 --> 00:44:10.100 about 50 milligrams an hour,

NOTE Confidence: 0.533758568

00:44:10.100 --> 00:44:11.468 which equates to about a week.

NOTE Confidence: 0.533758568

00:44:11.470 --> 00:44:13.420 Of coffee or tea and trying

NOTE Confidence: 0.533758568

00:44:13.420 --> 00:44:15.136 to recommend that people avoid

NOTE Confidence: 0.533758568

00:44:15.136 --> 00:44:17.224 habitual use as much as possible,

NOTE Confidence: 0.864166066666667

00:44:17.230 --> 00:44:20.329 especially shift workers.

NOTE Confidence: 0.864166066666667

00:44:20.330 --> 00:44:22.798 And then avoiding caffeine

NOTE Confidence: 0.864166066666667

00:44:22.798 --> 00:44:25.574 within six hours of sleep.

NOTE Confidence: 0.864166066666667

00:44:25.574 --> 00:44:28.346 Unless required by job demands so

NOTE Confidence: 0.864166066666667

00:44:28.346 --> 00:44:31.677 that we minimize the impact of

NOTE Confidence: 0.864166066666667

00:44:31.677 --> 00:44:34.452 caffeine on subsequent sleep and

NOTE Confidence: 0.864166066666667

00:44:34.452 --> 00:44:36.762 then other stimulants like Modafinil

NOTE Confidence: 0.864166066666667

00:44:36.762 --> 00:44:38.610 certainly can be prescribed.

NOTE Confidence: 0.864166066666667

00:44:38.610 --> 00:44:40.295 There are some studies that

NOTE Confidence: 0.864166066666667

00:44:40.295 --> 00:44:42.452 support the use of Modafinil for

NOTE Confidence: 0.864166066666667

00:44:42.452 --> 00:44:44.088 some shift working situations,

NOTE Confidence: 0.864166066666667

00:44:44.090 --> 00:44:46.057 but of course that should be done

NOTE Confidence: 0.864166066666667

00:44:46.057 --> 00:44:48.514 in a very as needed basis with

NOTE Confidence: 0.864166066666667

00:44:48.514 --> 00:44:50.444 oversight of the physician because

NOTE Confidence: 0.864166066666667

00:44:50.444 --> 00:44:52.597 the use of these stimulants is

NOTE Confidence: 0.864166066666667

00:44:52.597 --> 00:44:54.824 really going to depend on the nature

NOTE Confidence: 0.864166066666667

00:44:54.824 --> 00:44:56.920 of the job and the type of shift.

NOTE Confidence: 0.864166066666667

00:44:56.920 --> 00:44:59.448 The person is doing.

NOTE Confidence: 0.864166066666667

00:44:59.450 --> 00:45:02.866 On the job napping as a countermeasure,

NOTE Confidence: 0.864166066666667

00:45:02.870 --> 00:45:04.410 you know this is sort of this

NOTE Confidence: 0.864166066666667

00:45:04.410 --> 00:45:05.430 is your safety valve.

NOTE Confidence: 0.864166066666667

00:45:05.430 --> 00:45:07.814 This is the way that a person who's

NOTE Confidence: 0.864166066666667

00:45:07.814 --> 00:45:10.339 at work and now suddenly feeling

NOTE Confidence: 0.864166066666667

00:45:10.339 --> 00:45:12.195 that excessive sleepiness can

NOTE Confidence: 0.864166066666667

00:45:12.195 --> 00:45:14.519 relieve some of that sleepiness.

NOTE Confidence: 0.864166066666667

00:45:14.520 --> 00:45:18.366 And so having nap rooms, you know,

NOTE Confidence: 0.864166066666667

00:45:18.366 --> 00:45:19.644 in hospitals we have call rooms,

NOTE Confidence: 0.864166066666667

00:45:19.650 --> 00:45:21.482 but using them during the day for Naps

NOTE Confidence: 0.864166066666667

00:45:21.482 --> 00:45:23.207 to release sleepiness is a good idea.

NOTE Confidence: 0.864166066666667

00:45:23.210 --> 00:45:24.500 In other occupations,

NOTE Confidence: 0.864166066666667

00:45:24.500 --> 00:45:27.080 just getting that and and napping

NOTE Confidence: 0.864166066666667

00:45:27.080 --> 00:45:29.038 vironment in place is important.

NOTE Confidence: 0.864166066666667

00:45:29.040 --> 00:45:32.916 And we in this area have in

NOTE Confidence: 0.864166066666667

00:45:32.916 --> 00:45:35.556 some parts of the world,

NOTE Confidence: 0.864166066666667

00:45:35.560 --> 00:45:37.695 pilots can actually nap in the cockpit,

NOTE Confidence: 0.864166066666667

00:45:37.700 --> 00:45:39.218 can of course have only one

NOTE Confidence: 0.864166066666667

00:45:39.218 --> 00:45:40.820 pilot at a time came out,

NOTE Confidence: 0.864166066666667

00:45:40.820 --> 00:45:43.500 the other has to be awake and focused.

NOTE Confidence: 0.864166066666667

00:45:43.500 --> 00:45:45.216 But when we have a pilot

NOTE Confidence: 0.864166066666667

00:45:45.216 --> 00:45:46.360 napping in the cockpit,

NOTE Confidence: 0.864166066666667

00:45:46.360 --> 00:45:49.780 there's huge risk of negative consequences

NOTE Confidence: 0.864166066666667

00:45:49.780 --> 00:45:51.500 associated with sleep inertia.

NOTE Confidence: 0.864166066666667

00:45:51.500 --> 00:45:53.375 So we recommend that pilots

NOTE Confidence: 0.864166066666667

00:45:53.375 --> 00:45:55.751 limit their nap in their cockpit

NOTE Confidence: 0.864166066666667

00:45:55.751 --> 00:45:57.856 seat to 40 minutes maximum,

NOTE Confidence: 0.864166066666667

00:45:57.860 --> 00:45:59.258 and that they're we tell them

NOTE Confidence: 0.864166066666667

00:45:59.258 --> 00:46:00.460 they're not allowed to take.

NOTE Confidence: 0.864166066666667

00:46:00.460 --> 00:46:02.025 The controls of the aircraft

NOTE Confidence: 0.864166066666667

00:46:02.025 --> 00:46:03.932 until 20 minutes have passed from

NOTE Confidence: 0.864166066666667

00:46:03.932 --> 00:46:05.624 the time that they've woken up,

NOTE Confidence: 0.864166066666667

00:46:05.630 --> 00:46:07.028 and during that time they have

NOTE Confidence: 0.864166066666667

00:46:07.028 --> 00:46:08.414 to come back into situational

NOTE Confidence: 0.864166066666667

00:46:08.414 --> 00:46:10.010 awareness with their copilot.

NOTE Confidence: 0.864166066666667

00:46:10.010 --> 00:46:12.404 So this is an example of a

NOTE Confidence: 0.864166066666667

00:46:12.404 --> 00:46:14.329 situation where napping can be used,

NOTE Confidence: 0.864166066666667

00:46:14.330 --> 00:46:17.138 but has to be used in a very prescriptive

NOTE Confidence: 0.864166066666667

00:46:17.138 --> 00:46:19.338 manner in order to maintain safety.

NOTE Confidence: 0.864166066666667

00:46:19.340 --> 00:46:22.749 And then caffeine naps for short breaks,

NOTE Confidence: 0.864166066666667

00:46:22.750 --> 00:46:25.369 like if a person has a lunch break and

NOTE Confidence: 0.864166066666667

00:46:25.369 --> 00:46:27.862 has an opportunity to have a little

NOTE Confidence: 0.864166066666667

00:46:27.862 --> 00:46:30.876 bit of caffeine and then a very short nap.

NOTE Confidence: 0.864166066666667

00:46:30.880 --> 00:46:32.272 That caffeine can mitigate

NOTE Confidence: 0.864166066666667

00:46:32.272 --> 00:46:34.012 the impact of sleep inertia,

NOTE Confidence: 0.864166066666667

00:46:34.020 --> 00:46:36.393 and that can be a very powerful

NOTE Confidence: 0.864166066666667

00:46:36.393 --> 00:46:37.410 countermeasure for getting

NOTE Confidence: 0.864166066666667

00:46:37.474 --> 00:46:39.226 through the rest of the shift.

NOTE Confidence: 0.864166066666667

00:46:39.230 --> 00:46:41.252 Exercise and activity breaks are another

NOTE Confidence: 0.864166066666667

00:46:41.252 --> 00:46:43.528 on the job countermeasure that can be used.

NOTE Confidence: 0.864166066666667

00:46:43.530 --> 00:46:44.722 I wanna emphasize there's,

NOTE Confidence: 0.864166066666667

00:46:44.722 --> 00:46:45.318 you know,

NOTE Confidence: 0.864166066666667

00:46:45.320 --> 00:46:46.880 evidence for this but it's limited.

NOTE Confidence: 0.864166066666667

00:46:46.880 --> 00:46:48.693 You know the the best countermeasure we

NOTE Confidence: 0.864166066666667

00:46:48.693 --> 00:46:50.490 would lose would target sleep systems.

NOTE Confidence: 0.864166066666667

00:46:50.490 --> 00:46:53.290 Circadian systems exercise seems

NOTE Confidence: 0.864166066666667

00:46:53.290 --> 00:46:56.790 to have short term benefit,

NOTE Confidence: 0.864166066666667

00:46:56.790 --> 00:46:59.338 so short stretch breaks during long surgeries

NOTE Confidence: 0.864166066666667

00:46:59.338 --> 00:47:01.727 and operating rooms seem to be beneficial.

NOTE Confidence: 0.864166066666667

00:47:01.730 --> 00:47:05.480 That's probably not sleep related.

NOTE Confidence: 0.864166066666667

00:47:05.480 --> 00:47:06.060 You know,

NOTE Confidence: 0.864166066666667

00:47:06.060 --> 00:47:08.090 you're you're not getting a huge benefit.

NOTE Confidence: 0.864166066666667

00:47:08.090 --> 00:47:10.932 There has been one study at NASA

NOTE Confidence: 0.864166066666667

00:47:10.932 --> 00:47:13.420 by Laura Barker and colleagues

NOTE Confidence: 0.864166066666667

00:47:13.420 --> 00:47:16.234 that used blue enriched light in a

NOTE Confidence: 0.864166066666667

00:47:16.234 --> 00:47:18.746 break room with exercise machines

NOTE Confidence: 0.864166066666667

00:47:18.746 --> 00:47:21.190 that mission controllers could

NOTE Confidence: 0.864166066666667

00:47:21.190 --> 00:47:23.634 access during night shifts.

NOTE Confidence: 0.864166066666667

00:47:23.640 --> 00:47:27.304 And they found that.

NOTE Confidence: 0.864166066666667

00:47:27.304 --> 00:47:29.136 With this.

NOTE Confidence: 0.864166066666667

00:47:29.140 --> 00:47:30.500 This exercise break paired

NOTE Confidence: 0.864166066666667

00:47:30.500 --> 00:47:32.540 with the light on the mission

NOTE Confidence: 0.824163189166667

00:47:32.600 --> 00:47:34.176 controllers had better alertness

NOTE Confidence: 0.824163189166667

00:47:34.176 --> 00:47:36.146 and performance on the job

NOTE Confidence: 0.824163189166667

00:47:36.146 --> 00:47:37.699 after a bit of exercise.

NOTE Confidence: 0.824163189166667

00:47:37.700 --> 00:47:39.548 But of course this isn't a replacement

NOTE Confidence: 0.824163189166667

00:47:39.548 --> 00:47:41.416 for sleep, so it's really important

NOTE Confidence: 0.824163189166667

00:47:41.416 --> 00:47:43.420 to educate the workforce on that.

NOTE Confidence: 0.824163189166667

00:47:43.420 --> 00:47:45.390 And then finally, you know,

NOTE Confidence: 0.824163189166667

00:47:45.390 --> 00:47:47.660 this is just a hypothetical.

NOTE Confidence: 0.824163189166667

00:47:47.660 --> 00:47:49.785 We really don't know anything

NOTE Confidence: 0.824163189166667

00:47:49.785 --> 00:47:51.485 about countermeasures that will

NOTE Confidence: 0.824163189166667

00:47:51.485 --> 00:47:53.357 reduce risk in the long term.

NOTE Confidence: 0.824163189166667

00:47:53.360 --> 00:47:56.377 And there's a recent study that suggested

NOTE Confidence: 0.824163189166667

00:47:56.377 --> 00:47:59.337 that limiting eating to daytime may prevent.

NOTE Confidence: 0.824163189166667

00:47:59.340 --> 00:48:01.845 Some of that internal misalignment

NOTE Confidence: 0.824163189166667

00:48:01.845 --> 00:48:04.350 that comes with glucose intolerance

NOTE Confidence: 0.824163189166667

00:48:04.426 --> 00:48:05.500 with nightwork.

NOTE Confidence: 0.824163189166667

00:48:05.500 --> 00:48:06.744 This is very early.

NOTE Confidence: 0.824163189166667

00:48:06.744 --> 00:48:08.299 This was a lab study.

NOTE Confidence: 0.824163189166667

00:48:08.300 --> 00:48:09.860 We don't know how this actually

NOTE Confidence: 0.824163189166667

00:48:09.860 --> 00:48:11.548 translates to the real world or

NOTE Confidence: 0.824163189166667

00:48:11.548 --> 00:48:12.736 this long term consequences.

NOTE Confidence: 0.824163189166667

00:48:12.740 --> 00:48:14.651 These are areas that I think are

NOTE Confidence: 0.824163189166667

00:48:14.651 --> 00:48:16.230 really important for study in the

NOTE Confidence: 0.824163189166667

00:48:16.230 --> 00:48:17.882 future because we have no idea if

NOTE Confidence: 0.824163189166667

00:48:17.943 --> 00:48:19.768 the countermeasures that we're using

NOTE Confidence: 0.824163189166667

00:48:19.768 --> 00:48:21.593 to mitigate the short-term impacts

NOTE Confidence: 0.824163189166667

00:48:21.600 --> 00:48:24.606 are healthy in the long term.

NOTE Confidence: 0.824163189166667

00:48:24.610 --> 00:48:26.090 So just to wrap up,

NOTE Confidence: 0.824163189166667

00:48:26.090 --> 00:48:28.202 I'm going to take a couple slides here

NOTE Confidence: 0.824163189166667

00:48:28.202 --> 00:48:30.097 to tell you about an implementation

NOTE Confidence: 0.824163189166667

00:48:30.097 --> 00:48:32.350 example that we've done in my lab.

NOTE Confidence: 0.824163189166667

00:48:32.350 --> 00:48:33.748 So in aviation,

NOTE Confidence: 0.824163189166667

00:48:33.748 --> 00:48:35.146 I mentioned previously,

NOTE Confidence: 0.824163189166667

00:48:35.150 --> 00:48:36.334 you know,

NOTE Confidence: 0.824163189166667

00:48:36.334 --> 00:48:39.994 obviously safety is #1 and there are

NOTE Confidence: 0.824163189166667

00:48:39.994 --> 00:48:43.417 lots of regulations in place to make

NOTE Confidence: 0.824163189166667

00:48:43.417 --> 00:48:47.836 sure that pilots are set up for success with.

NOTE Confidence: 0.824163189166667

00:48:47.840 --> 00:48:48.845 Their work hours,

NOTE Confidence: 0.824163189166667

00:48:48.845 --> 00:48:51.190 with a number of hours they have

NOTE Confidence: 0.824163189166667

00:48:51.263 --> 00:48:52.986 to have off in between shifts.

NOTE Confidence: 0.824163189166667

00:48:52.986 --> 00:48:54.954 The number of pilots who have to be

NOTE Confidence: 0.824163189166667

00:48:54.954 --> 00:48:56.857 in the cockpit at any given time,

NOTE Confidence: 0.824163189166667

00:48:56.860 --> 00:48:58.258 airlines are all in the US,

NOTE Confidence: 0.824163189166667

00:48:58.260 --> 00:49:00.270 are also required to have a

NOTE Confidence: 0.824163189166667

00:49:00.270 --> 00:49:01.610 fatigue risk management program

NOTE Confidence: 0.824163189166667

00:49:01.673 --> 00:49:03.589 with that ongoing education

NOTE Confidence: 0.824163189166667

00:49:03.589 --> 00:49:05.026 with countermeasure deployment.

NOTE Confidence: 0.824163189166667

00:49:05.030 --> 00:49:07.904 And you know that that's again

NOTE Confidence: 0.824163189166667

00:49:07.904 --> 00:49:09.820 an iterative process that's

NOTE Confidence: 0.824163189166667

00:49:09.912 --> 00:49:11.864 constantly evolving and shifting

NOTE Confidence: 0.824163189166667

00:49:11.864 --> 00:49:15.290 based on the nature of the work.

NOTE Confidence: 0.824163189166667

00:49:15.290 --> 00:49:17.144 And with this we can test

NOTE Confidence: 0.824163189166667

00:49:17.144 --> 00:49:18.858 countermeasures to see how effective

NOTE Confidence: 0.824163189166667

00:49:18.858 --> 00:49:20.938 they are for future deployments.

NOTE Confidence: 0.824163189166667

00:49:20.940 --> 00:49:23.764 So we did a study using luminet glasses,

NOTE Confidence: 0.824163189166667

00:49:23.770 --> 00:49:26.212 which are light emitting glasses with

NOTE Confidence: 0.824163189166667

00:49:26.212 --> 00:49:28.790 pilots who were flying early starts.

NOTE Confidence: 0.824163189166667

00:49:28.790 --> 00:49:32.405 So basically these pilots were

NOTE Confidence: 0.824163189166667

00:49:32.405 --> 00:49:35.218 working for five days in a row.

NOTE Confidence: 0.824163189166667

00:49:35.220 --> 00:49:37.464 Um flying starting around 5-6 in

NOTE Confidence: 0.824163189166667

00:49:37.464 --> 00:49:40.207 the morning and we gave them these

NOTE Confidence: 0.824163189166667

00:49:40.207 --> 00:49:42.152 luminet glasses in addition to

NOTE Confidence: 0.824163189166667

00:49:42.152 --> 00:49:44.650 all of the other benefits that

NOTE Confidence: 0.824163189166667

00:49:44.650 --> 00:49:47.116 they get from the fatigue growth

NOTE Confidence: 0.824163189166667

00:49:47.120 --> 00:49:49.430 management program to help attempt

NOTE Confidence: 0.824163189166667

00:49:49.430 --> 00:49:51.740 to shift their circadian rhythm

NOTE Confidence: 0.824163189166667

00:49:51.810 --> 00:49:54.078 and to enhance their alertness in

NOTE Confidence: 0.824163189166667

00:49:54.078 --> 00:49:56.374 going into that room they start

NOTE Confidence: 0.824163189166667

00:49:56.374 --> 00:49:58.873 and we compared that to a placebos.

NOTE Confidence: 0.824163189166667

00:49:58.880 --> 00:50:00.670 This was a randomized crossover

NOTE Confidence: 0.824163189166667

00:50:00.670 --> 00:50:02.460 trial within participants and we

NOTE Confidence: 0.824163189166667

00:50:02.524 --> 00:50:04.144 were very fortunate that this

NOTE Confidence: 0.824163189166667

00:50:04.144 --> 00:50:05.440 airline let us change.

NOTE Confidence: 0.824163189166667

00:50:05.440 --> 00:50:08.044 Balance schedules so that we can be

NOTE Confidence: 0.824163189166667

00:50:08.044 --> 00:50:09.799 very quasi experimental about it.

NOTE Confidence: 0.824163189166667

00:50:09.800 --> 00:50:11.510 And in the control condition,

NOTE Confidence: 0.824163189166667

00:50:11.510 --> 00:50:12.680 they didn't have any light.

NOTE Confidence: 0.824163189166667

00:50:12.680 --> 00:50:14.885 They just had these inner safety glasses,

NOTE Confidence: 0.824163189166667

00:50:14.890 --> 00:50:17.482 but we didn't tell them that they were inert.

NOTE Confidence: 0.824163189166667

00:50:17.490 --> 00:50:18.384 And you know,

NOTE Confidence: 0.824163189166667

00:50:18.384 --> 00:50:20.470 very quickly what we found was that

NOTE Confidence: 0.824163189166667

00:50:20.533 --> 00:50:22.871 they wore both of the glasses for

NOTE Confidence: 0.824163189166667

00:50:22.871 --> 00:50:24.609 the prescribed number of minutes,

NOTE Confidence: 0.824163189166667

00:50:24.610 --> 00:50:26.872 25 minutes in the morning before

NOTE Confidence: 0.824163189166667

00:50:26.872 --> 00:50:28.380 they went to work.

NOTE Confidence: 0.824163189166667

00:50:28.380 --> 00:50:29.117 And.

NOTE Confidence: 0.824163189166667

00:50:29.117 --> 00:50:33.539 We found small but positive effects,

NOTE Confidence: 0.824163189166667

00:50:33.540 --> 00:50:35.820 so we saw small improvements in

NOTE Confidence: 0.824163189166667

00:50:35.820 --> 00:50:38.034 weight so and small improvements

NOTE Confidence: 0.824163189166667

00:50:38.034 --> 00:50:39.879 in sleep efficiency.

NOTE Confidence: 0.824163189166667

00:50:39.880 --> 00:50:43.142 And we also saw a very small

NOTE Confidence: 0.824163189166667

00:50:43.142 --> 00:50:44.540 but significant positive

NOTE Confidence: 0.89195839

00:50:44.632 --> 00:50:46.918 improvement in sleepiness.

NOTE Confidence: 0.89195839

00:50:46.920 --> 00:50:50.616 So this is, you know again is this.

NOTE Confidence: 0.89195839

00:50:50.620 --> 00:50:53.140 You know, going to make a huge splash and is

NOTE Confidence: 0.89195839

00:50:53.205 --> 00:50:55.557 everybody going to use light glasses now?

NOTE Confidence: 0.89195839

00:50:55.560 --> 00:50:58.296 But this is just one additional

NOTE Confidence: 0.89195839

00:50:58.300 --> 00:51:00.772 countermeasure that may be useful for

NOTE Confidence: 0.89195839

00:51:00.772 --> 00:51:03.295 especially people who are struggling to

NOTE Confidence: 0.89195839

00:51:03.295 --> 00:51:06.095 deal with those early starts in aviation.

NOTE Confidence: 0.89195839

00:51:06.100 --> 00:51:08.713 So overall, um,

NOTE Confidence: 0.89195839

00:51:08.713 --> 00:51:12.410 shift work perfects everybody's body.

NOTE Confidence: 0.89195839

00:51:12.410 --> 00:51:14.570 In addition to sleep,

NOTE Confidence: 0.89195839

00:51:14.570 --> 00:51:16.490 we have short and long term

NOTE Confidence: 0.89195839

00:51:16.490 --> 00:51:18.225 outcomes and of course many

NOTE Confidence: 0.89195839

00:51:18.225 --> 00:51:20.145 mitigations for the short term,

NOTE Confidence: 0.89195839

00:51:20.150 --> 00:51:21.790 but we don't really understand

NOTE Confidence: 0.89195839

00:51:21.790 --> 00:51:23.770 what's happening in the long term.

NOTE Confidence: 0.89195839

00:51:23.770 --> 00:51:24.898 As a reminder,

NOTE Confidence: 0.89195839

00:51:24.898 --> 00:51:27.530 here's the manuscript that I mentioned where

NOTE Confidence: 0.89195839

00:51:27.600 --> 00:51:30.085 most of this information is drawn from.

NOTE Confidence: 0.89195839

00:51:30.090 --> 00:51:31.854 And then if you have further questions,

NOTE Confidence: 0.89195839

00:51:31.860 --> 00:51:33.190 feel free to reach out from that.

NOTE Confidence: 0.89195839

00:51:33.190 --> 00:51:34.492 Thanks for your attention and I'm

NOTE Confidence: 0.89195839

00:51:34.492 --> 00:51:35.967 happy to take questions now if we have.

NOTE Confidence: 0.948615255

00:51:38.570 --> 00:51:40.146 Thank you so much Doctor Evans.

NOTE Confidence: 0.948615255

00:51:40.146 --> 00:51:41.591 That was a fantastic and

NOTE Confidence: 0.948615255

00:51:41.591 --> 00:51:45.430 a very thoughtful talk.

NOTE Confidence: 0.867411895

00:51:45.430 --> 00:51:48.670 I welcome everyone to ask questions.

NOTE Confidence: 0.867411895

00:51:48.670 --> 00:51:51.930 I don't see any question in the chat room.

NOTE Confidence: 0.867411895

00:51:51.930 --> 00:51:54.470 Please feel free to unmute yourself and ask.

NOTE Confidence: 0.761608643333333

00:51:55.370 --> 00:51:58.556 And hi, I have a question, Aaron.

NOTE Confidence: 0.761608643333333

00:51:58.556 --> 00:52:02.100 So one of the problems I used to see

NOTE Confidence: 0.761608643333333

00:52:02.100 --> 00:52:06.320 in practice was someone who had been a

NOTE Confidence: 0.761608643333333

00:52:06.320 --> 00:52:09.540 nurse for decades with terrible shifts

NOTE Confidence: 0.761608643333333

00:52:09.540 --> 00:52:12.220 that they in that they requested.

NOTE Confidence: 0.761608643333333

00:52:12.220 --> 00:52:14.130 I only want to work three days a

NOTE Confidence: 0.761608643333333

00:52:14.130 --> 00:52:17.448 week and their sleep was terrible.

NOTE Confidence: 0.761608643333333

00:52:17.450 --> 00:52:19.040 During that whole interval and they

NOTE Confidence: 0.899742388

00:52:19.050 --> 00:52:21.840 assumed that once they stopped

NOTE Confidence: 0.91079894625

00:52:21.850 --> 00:52:22.996 working, everything would

NOTE Confidence: 0.91079894625

00:52:22.996 --> 00:52:24.906 become normal and it didn't.

NOTE Confidence: 0.91079894625

00:52:24.910 --> 00:52:27.830 And they were very, very difficult to treat.

NOTE Confidence: 0.91079894625

00:52:27.830 --> 00:52:31.318 Do you have any thoughts on that scenario?

NOTE Confidence: 0.91079894625

00:52:31.320 --> 00:52:32.928 Yeah. Oh, my goodness.

NOTE Confidence: 0.91079894625

00:52:32.928 --> 00:52:34.476 And Professor Krieger, Barry,

NOTE Confidence: 0.91079894625

00:52:34.476 --> 00:52:36.156 thank you for the questions.

NOTE Confidence: 0.91079894625

00:52:36.160 --> 00:52:39.160 Very nice to see you.

NOTE Confidence: 0.91079894625

00:52:39.160 --> 00:52:40.765 Thank you. Yeah.

NOTE Confidence: 0.91079894625

00:52:40.765 --> 00:52:44.590 So, you know, I think Doctor Vicey

NOTE Confidence: 0.91079894625

00:52:44.590 --> 00:52:47.250 has some work in this area looking

NOTE Confidence: 0.91079894625

00:52:47.250 --> 00:52:50.547 at how years of shift work actually

NOTE Confidence: 0.91079894625

00:52:50.547 --> 00:52:53.332 leads to continued disruption once a

NOTE Confidence: 0.91079894625

00:52:53.332 --> 00:52:55.786 person stops engaging in shift work.

NOTE Confidence: 0.91079894625

00:52:55.790 --> 00:52:57.869 And so to me, what that says,

NOTE Confidence: 0.91079894625

00:52:57.870 --> 00:53:00.966 the target really has to be early education.

NOTE Confidence: 0.91079894625

00:53:00.970 --> 00:53:02.910 It has to be helping.

NOTE Confidence: 0.91079894625

00:53:02.910 --> 00:53:03.462 You know,

NOTE Confidence: 0.91079894625

00:53:03.462 --> 00:53:05.670 I think people do that type of scheduling,

NOTE Confidence: 0.91079894625

00:53:05.670 --> 00:53:07.425 schedule cramming because

NOTE Confidence: 0.91079894625

00:53:07.425 --> 00:53:09.180 they're not understanding.

NOTE Confidence: 0.91079894625

00:53:09.180 --> 00:53:11.290 The bigger long term consequences

NOTE Confidence: 0.91079894625

00:53:11.290 --> 00:53:13.769 of their decision making and so

NOTE Confidence: 0.91079894625

00:53:13.769 --> 00:53:16.113 that would be another to add to the

NOTE Confidence: 0.91079894625

00:53:16.113 --> 00:53:18.249 list of long term consequences.

NOTE Confidence: 0.91079894625

00:53:18.250 --> 00:53:20.350 You know you could have persistent

NOTE Confidence: 0.91079894625

00:53:20.350 --> 00:53:22.090 ongoing sleep issues just based

NOTE Confidence: 0.91079894625

00:53:22.090 --> 00:53:23.500 on years of shift work.

NOTE Confidence: 0.91079894625

00:53:23.500 --> 00:53:24.788 I don't think there's been a lot

NOTE Confidence: 0.91079894625

00:53:24.788 --> 00:53:26.333 of work in that area but certainly

NOTE Confidence: 0.91079894625

00:53:26.333 --> 00:53:27.978 there's enough now that I think it

NOTE Confidence: 0.91079894625

00:53:27.978 --> 00:53:29.634 could be added to the list as a caution.

NOTE Confidence: 0.91079894625

00:53:29.640 --> 00:53:31.296 But again I don't think shift

NOTE Confidence: 0.91079894625

00:53:31.296 --> 00:53:33.029 workers even realize as a as a

NOTE Confidence: 0.91079894625

00:53:33.029 --> 00:53:34.373 you know group if you serve it

NOTE Confidence: 0.91079894625

00:53:34.433 --> 00:53:36.098 someone should probably do that.

NOTE Confidence: 0.91079894625

00:53:36.100 --> 00:53:37.715 If you surveyed shift workers

NOTE Confidence: 0.91079894625

00:53:37.715 --> 00:53:39.720 I bet that you would find.

NOTE Confidence: 0.91079894625

00:53:39.720 --> 00:53:41.376 That they didn't even realize there

NOTE Confidence: 0.91079894625

00:53:41.376 --> 00:53:43.054 were increased risks of all of

NOTE Confidence: 0.91079894625

00:53:43.054 --> 00:53:44.359 these long term health outcomes.

NOTE Confidence: 0.91079894625

00:53:44.360 --> 00:53:46.970 And so I think we need to do a better

NOTE Confidence: 0.91079894625

00:53:47.048 --> 00:53:49.240 job educating these workforces,

NOTE Confidence: 0.91079894625

00:53:49.240 --> 00:53:51.760 particularly younger patients to,

NOTE Confidence: 0.91079894625

00:53:51.760 --> 00:53:53.020 you know,

NOTE Confidence: 0.91079894625

00:53:53.020 --> 00:53:55.294 help them understand how their decisions

NOTE Confidence: 0.91079894625

00:53:55.294 --> 00:53:57.760 now may impact them in the future.

NOTE Confidence: 0.91079894625

00:53:57.760 --> 00:54:00.919 Because I I don't know of any work that's

NOTE Confidence: 0.91079894625

00:54:00.919 --> 00:54:04.395 been done to mitigate the consequences after,

NOTE Confidence: 0.91079894625

00:54:04.400 --> 00:54:04.960 you know,

NOTE Confidence: 0.91079894625

00:54:04.960 --> 00:54:06.640 after shift work has been completed,

NOTE Confidence: 0.91079894625

00:54:06.640 --> 00:54:08.270 after the years of shift

NOTE Confidence: 0.91079894625

00:54:08.270 --> 00:54:09.574 work have been completed.

NOTE Confidence: 0.91079894625

00:54:09.580 --> 00:54:10.412 Thank you.

NOTE Confidence: 0.91079894625

00:54:10.412 --> 00:54:10.828 Yeah.

NOTE Confidence: 0.896091802142857

00:54:11.750 --> 00:54:13.742 Yeah. And it's it's also harder

NOTE Confidence: 0.896091802142857

00:54:13.742 --> 00:54:16.154 for ones who go back and forth

NOTE Confidence: 0.896091802142857

00:54:16.154 --> 00:54:17.562 from you know shift night,

NOTE Confidence: 0.896091802142857

00:54:17.562 --> 00:54:18.902 night shift to day shift.

NOTE Confidence: 0.896091802142857

00:54:18.910 --> 00:54:20.425 You know, it keeps changing

NOTE Confidence: 0.896091802142857

00:54:20.425 --> 00:54:22.317 versus having a set night shift

NOTE Confidence: 0.896091802142857

00:54:22.317 --> 00:54:24.225 versus day shift routine I guess.

NOTE Confidence: 0.936144398333333

00:54:25.890 --> 00:54:28.170 Absolutely. And you know I think,

NOTE Confidence: 0.936144398333333

00:54:28.170 --> 00:54:30.564 I think we have you know there are people

NOTE Confidence: 0.936144398333333

00:54:30.564 --> 00:54:32.850 who are just victims of circumstance.

NOTE Confidence: 0.936144398333333

00:54:32.850 --> 00:54:36.330 They have no control over their

NOTE Confidence: 0.936144398333333

00:54:36.330 --> 00:54:38.874 situation and you know that that's

NOTE Confidence: 0.936144398333333

00:54:38.874 --> 00:54:40.604 that's the hardest I think.

NOTE Confidence: 0.936144398333333

00:54:40.610 --> 00:54:42.690 But when people have some control

NOTE Confidence: 0.936144398333333

00:54:42.690 --> 00:54:45.609 maybe they can choose to work four

NOTE Confidence: 0.936144398333333

00:54:45.609 --> 00:54:48.433 days instead of three and and you

NOTE Confidence: 0.936144398333333

00:54:48.433 --> 00:54:50.824 know have maybe a more a schedule

NOTE Confidence: 0.936144398333333

00:54:50.824 --> 00:54:52.426 that allows them to maybe shift

NOTE Confidence: 0.936144398333333

00:54:52.426 --> 00:54:54.606 from a day to an evening to a night.

NOTE Confidence: 0.936144398333333

00:54:54.610 --> 00:54:56.050 You know if one can.

NOTE Confidence: 0.936144398333333

00:54:56.050 --> 00:54:58.640 Bid for a schedule that allows that,

NOTE Confidence: 0.936144398333333

00:54:58.640 --> 00:54:59.144 that's better.

NOTE Confidence: 0.936144398333333

00:54:59.144 --> 00:55:00.656 You know, that's going to be

NOTE Confidence: 0.936144398333333

00:55:00.656 --> 00:55:02.329 better for their short term health.

NOTE Confidence: 0.936144398333333

00:55:02.330 --> 00:55:02.924 And you know,

NOTE Confidence: 0.936144398333333

00:55:02.924 --> 00:55:04.112 we don't know if it'll impact

NOTE Confidence: 0.936144398333333

00:55:04.112 --> 00:55:05.040 their long-term health,

NOTE Confidence: 0.936144398333333

00:55:05.040 --> 00:55:07.092 but I would hypothesize that it

NOTE Confidence: 0.936144398333333

00:55:07.092 --> 00:55:09.032 probably would be better than trying

NOTE Confidence: 0.936144398333333

00:55:09.032 --> 00:55:11.560 to cram it all in to some crazy.

NOTE Confidence: 0.936144398333333

00:55:11.560 --> 00:55:14.200 I mean air traffic controllers do create,

NOTE Confidence: 0.936144398333333

00:55:14.200 --> 00:55:15.640 they call them Rattlers where

NOTE Confidence: 0.936144398333333

00:55:15.640 --> 00:55:17.080 they work a day shift,

NOTE Confidence: 0.936144398333333

00:55:17.080 --> 00:55:18.154 have the evening off and then

NOTE Confidence: 0.936144398333333

00:55:18.154 --> 00:55:19.343 come back for the night shift

NOTE Confidence: 0.936144398333333

00:55:19.343 --> 00:55:20.408 because they don't want it.

NOTE Confidence: 0.936144398333333

00:55:20.410 --> 00:55:22.300 They want to have like 5 days off in a row.

NOTE Confidence: 0.936144398333333

00:55:22.300 --> 00:55:24.136 But that doesn't make any sense,

NOTE Confidence: 0.936144398333333

00:55:24.140 --> 00:55:24.814 you know,

NOTE Confidence: 0.936144398333333

00:55:24.814 --> 00:55:27.173 from a from a sleep health perspective.

NOTE Confidence: 0.936144398333333

00:55:27.180 --> 00:55:28.728 And so a lot of the work that we

NOTE Confidence: 0.936144398333333

00:55:28.728 --> 00:55:30.288 do with air traffic controllers

NOTE Confidence: 0.936144398333333

00:55:30.288 --> 00:55:31.620 is really just education.

NOTE Confidence: 0.936144398333333

00:55:31.620 --> 00:55:32.104 You know,

NOTE Confidence: 0.936144398333333

00:55:32.104 --> 00:55:34.040 this is how this is affecting your body.

NOTE Confidence: 0.936144398333333

00:55:34.040 --> 00:55:35.816 And then maybe even showing them

NOTE Confidence: 0.936144398333333

00:55:35.816 --> 00:55:37.640 feedback on how they're performing,

NOTE Confidence: 0.936144398333333

00:55:37.640 --> 00:55:39.008 what their alertness looks like when

NOTE Confidence: 0.936144398333333

00:55:39.008 --> 00:55:40.309 they're doing that type of shift,

NOTE Confidence: 0.936144398333333

00:55:40.310 --> 00:55:42.004 that tends to be pretty powerful too.

NOTE Confidence: 0.88742978

00:55:45.280 --> 00:55:45.610 I have a

NOTE Confidence: 0.866040091578947

00:55:45.620 --> 00:55:47.748 question or answer as we were talking

NOTE Confidence: 0.866040091578947

00:55:47.748 --> 00:55:50.067 you know before I change is related

NOTE Confidence: 0.866040091578947

00:55:50.067 --> 00:55:51.752 to circadian rhythm shift worker.

NOTE Confidence: 0.866040091578947

00:55:51.760 --> 00:55:53.813 You know it takes a while to happen right?

NOTE Confidence: 0.866040091578947

00:55:53.813 --> 00:55:56.078 Example the duty hour changes.

NOTE Confidence: 0.866040091578947

00:55:56.080 --> 00:55:58.244 Now in terms of adopting this

NOTE Confidence: 0.866040091578947

00:55:58.244 --> 00:56:00.196 shift work fatigue mitigation,

NOTE Confidence: 0.866040091578947

00:56:00.200 --> 00:56:02.262 what do you think you know would

NOTE Confidence: 0.866040091578947

00:56:02.262 --> 00:56:04.086 help the most for institutions to

NOTE Confidence: 0.866040091578947

00:56:04.086 --> 00:56:05.858 adopt these changes nationally,

NOTE Confidence: 0.866040091578947

00:56:05.860 --> 00:56:08.009 for example on the job napping or

NOTE Confidence: 0.866040091578947

00:56:08.009 --> 00:56:10.499 nap room or the proper scheduling.

NOTE Confidence: 0.866040091578947

00:56:10.500 --> 00:56:11.820 You know all these things

NOTE Confidence: 0.866040091578947

00:56:11.820 --> 00:56:12.876 but what's your thought?

NOTE Confidence: 0.858054608888889

00:56:14.410 --> 00:56:15.964 Yeah. Well, I mean I definitely think

NOTE Confidence: 0.858054608888889

00:56:15.964 --> 00:56:17.385 it varies, occupation to occupation.

NOTE Confidence: 0.858054608888889

00:56:17.385 --> 00:56:19.236 So as you mentioned, I worked,

NOTE Confidence: 0.858054608888889

00:56:19.236 --> 00:56:21.147 you know, I worked on the resident

NOTE Confidence: 0.858054608888889

00:56:21.147 --> 00:56:23.249 work hour studies in Boston when I

NOTE Confidence: 0.858054608888889

00:56:23.249 --> 00:56:25.494 was there before coming to NASA and

NOTE Confidence: 0.858054608888889

00:56:25.494 --> 00:56:27.164 that was really challenging because,

NOTE Confidence: 0.858054608888889

00:56:27.170 --> 00:56:29.114 you know, I don't think that you can

NOTE Confidence: 0.858054608888889

00:56:29.114 --> 00:56:30.630 just regulate these problems away.

NOTE Confidence: 0.858054608888889

00:56:30.630 --> 00:56:32.846 I don't think the answer is simply saying,

NOTE Confidence: 0.858054608888889

00:56:32.850 --> 00:56:34.747 OK, we need to just cut work

NOTE Confidence: 0.858054608888889

00:56:34.747 --> 00:56:35.810 hours and that's it.

NOTE Confidence: 0.858054608888889

00:56:35.810 --> 00:56:36.974 In a hospital system,

NOTE Confidence: 0.858054608888889

00:56:36.974 --> 00:56:39.083 I think you all know very well

NOTE Confidence: 0.858054608888889

00:56:39.083 --> 00:56:41.162 you have to engage with the nurses

NOTE Confidence: 0.858054608888889

00:56:41.162 --> 00:56:43.020 and with the PA's and with all of

NOTE Confidence: 0.858054608888889

00:56:43.020 --> 00:56:44.350 the people who are going to be.

NOTE Confidence: 0.858054608888889

00:56:44.350 --> 00:56:46.737 Peripherally affected by a work hours change,

NOTE Confidence: 0.858054608888889

00:56:46.740 --> 00:56:48.972 you might have to do rounds twice a day.

NOTE Confidence: 0.858054608888889

00:56:48.980 --> 00:56:51.120 So you're fundamentally changing

NOTE Confidence: 0.858054608888889

00:56:51.120 --> 00:56:54.160 the nature of how a work group

NOTE Confidence: 0.858054608888889

00:56:54.160 --> 00:56:56.260 has operated for a very long time.

NOTE Confidence: 0.858054608888889

00:56:56.260 --> 00:56:58.297 And to me, you know that's that.

NOTE Confidence: 0.858054608888889

00:56:58.300 --> 00:57:00.688 That's where implementation science comes in.

NOTE Confidence: 0.858054608888889

00:57:00.690 --> 00:57:01.418 You know,

NOTE Confidence: 0.858054608888889

00:57:01.418 --> 00:57:03.966 bringing in people who know how you

NOTE Confidence: 0.858054608888889

00:57:03.966 --> 00:57:06.446 know what the best practices are

NOTE Confidence: 0.858054608888889

00:57:06.446 --> 00:57:08.942 for implementing to make the change

NOTE Confidence: 0.858054608888889

00:57:08.942 --> 00:57:11.616 as effective as it can possibly be.

NOTE Confidence: 0.858054608888889

00:57:11.620 --> 00:57:13.700 Change is hard no matter what you do.

NOTE Confidence: 0.858054608888889

00:57:13.700 --> 00:57:13.995 But.

NOTE Confidence: 0.858054608888889

00:57:13.995 --> 00:57:16.060 Making sure that that change is done

NOTE Confidence: 0.858054608888889

00:57:16.060 --> 00:57:18.640 in the best possible way I think will

NOTE Confidence: 0.858054608888889

00:57:18.640 --> 00:57:20.763 help mitigate some of the reactivity

NOTE Confidence: 0.858054608888889

00:57:20.763 --> 00:57:23.091 that comes with just blanket changes

NOTE Confidence: 0.858054608888889

00:57:23.091 --> 00:57:24.740 that people end up hating.

NOTE Confidence: 0.886892723333333

00:57:27.320 --> 00:57:30.570 Right. Thank you. Two, we

NOTE Confidence: 0.9560518675

00:57:30.580 --> 00:57:32.160 have any other questions?

NOTE Confidence: 0.29285336

00:57:40.760 --> 00:57:43.358 Lauren, did you have any

NOTE Confidence: 0.29285336

00:57:43.358 --> 00:57:45.300 question? No, no. OK.

NOTE Confidence: 0.809715227

00:57:45.370 --> 00:57:46.834 Thank you. Thanks, Byron.

NOTE Confidence: 0.809715227

00:57:46.834 --> 00:57:49.030 Thank you for a fantastic talk.

NOTE Confidence: 0.809715227

00:57:49.030 --> 00:57:51.415 Good to see you. Good to see you too.

NOTE Confidence: 0.768260267777778

00:57:51.830 --> 00:57:53.550 Alright. Thank you so much

NOTE Confidence: 0.768260267777778

00:57:53.550 --> 00:57:54.926 again for this wonderful,

NOTE Confidence: 0.768260267777778

00:57:54.930 --> 00:57:57.674 fantastic talk as usual.

NOTE Confidence: 0.768260267777778

00:57:57.674 --> 00:57:59.686 And well, thank you everyone

NOTE Confidence: 0.768260267777778

00:57:59.686 --> 00:58:02.870 for joining us. Thank you.

NOTE Confidence: 0.9166093

00:58:02.870 --> 00:58:06.000 Thank you. Take care. Bye, bye.