

WEBVTT Kind: captions Language: en

00:00:00.180 --> 00:00:01.500 - Hi, I'm Melissa Knauert.

00:00:01.500 --> 00:00:02.490 Today, I'm gonna tell you

00:00:02.490 --> 00:00:04.350 about the sleep and circadian systems,

00:00:04.350 --> 00:00:07.920 and how they work together to create ideal sleep timing,

00:00:07.920 --> 00:00:09.570 and therefore, the ideal sleep quality

00:00:09.570 --> 00:00:12.690 and how you can use tips and tricks to move them around

00:00:12.690 --> 00:00:14.946 and sleep the best you can given your schedule.

00:00:17.940 --> 00:00:19.770 So sleep is really interesting.

00:00:19.770 --> 00:00:21.105 The timing of sleep,

00:00:21.105 --> 00:00:23.370 and immediately related to that,

00:00:23.370 --> 00:00:26.730 the quality and length of sleep is related to two systems.

00:00:26.730 --> 00:00:30.240 And so, we call them Process C and Process S.

00:00:30.240 --> 00:00:32.730 Process S is sleep process.

00:00:32.730 --> 00:00:35.730 And all that says is really, from the time you get up

00:00:35.730 --> 00:00:37.320 until the time you go back to sleep,

00:00:37.320 --> 00:00:39.627 you're slowly accumulating more and more sleepiness.

00:00:39.627 --> 00:00:42.570 And so as you can imagine, if you've been awake for an hour,

00:00:42.570 --> 00:00:43.770 you don't have a lot of sleepiness.

00:00:43.770 --> 00:00:45.060 If you've been awake for 30 hours,

00:00:45.060 --> 00:00:46.800 you have a lot of sleepiness.

00:00:46.800 --> 00:00:50.730 But every day combating that, and I often say, in tandem,

00:00:50.730 --> 00:00:51.900 is the circadian drive,

00:00:51.900 --> 00:00:54.660 which you could also call the awake drive.

00:00:54.660 --> 00:00:56.310 And so when you start in the morning,

00:00:56.310 --> 00:00:58.590 your circadian drive is essentially off.

00:00:58.590 --> 00:01:00.180 And then slowly through the day, it builds.  
00:01:00.180 --> 00:01:02.340 And as it builds, it makes you more and more awake.  
00:01:02.340 --> 00:01:04.470 And you can imagine it almost balancing out  
00:01:04.470 --> 00:01:06.000 or combating that sleepiness  
00:01:06.000 --> 00:01:08.730 so that in the afternoon, though there are some dips,  
00:01:08.730 --> 00:01:11.190 we know about the afternoon lull,  
00:01:11.190 --> 00:01:12.990 you really don't get sleepier and sleepier.  
00:01:12.990 --> 00:01:15.690 But then, suddenly, right before bedtime,  
00:01:15.690 --> 00:01:17.340 the circadian system turns off,  
00:01:17.340 --> 00:01:21.630 and it stops alerting us, it stops promoting awakeness.  
00:01:21.630 --> 00:01:24.120 Now, all of a sudden, you have this unopposed sleepiness  
00:01:24.120 --> 00:01:25.290 and you feel very tired.  
00:01:25.290 --> 00:01:28.380 And we call this either the sleep gate or sleep pressure,  
00:01:28.380 --> 00:01:30.360 and that's what allows us to go to sleep.  
00:01:30.360 --> 00:01:31.740 And then, as the night goes on,  
00:01:31.740 --> 00:01:33.450 the circadian system stays off.  
00:01:33.450 --> 00:01:35.580 And as it stays off, you can continue to sleep  
00:01:35.580 --> 00:01:38.580 and go through the normal cycles of sleep architecture  
00:01:38.580 --> 00:01:40.590 all the way till morning.  
00:01:40.590 --> 00:01:42.750 That time when the circadian system is off,  
00:01:42.750 --> 00:01:45.450 we call that biologic night or circadian night.  
00:01:45.450 --> 00:01:49.440 And aligning when we want to sleep with that biologic night  
00:01:49.440 --> 00:01:51.360 is one of the key parts of sleep hygiene  
00:01:51.360 --> 00:01:53.071 and the key parts of sleep health.  
00:01:56.190 --> 00:01:59.280 The circadian system going on during the day to alert you

00:01:59.280 --> 00:02:00.870 and then off at night to allow you to sleep

00:02:00.870 --> 00:02:02.040 is really important.

00:02:02.040 --> 00:02:05.430 And the way that the circadian system knows to do that,

00:02:05.430 --> 00:02:08.850 that's through things we call zeitgebers or time givers.

00:02:08.850 --> 00:02:11.010 And so the external cues in our environment,

00:02:11.010 --> 00:02:13.980 light, dark, feeding, exercise,

00:02:13.980 --> 00:02:16.680 transmit into the suprachiasmatic nucleus,

00:02:16.680 --> 00:02:19.590 which is our master clock, the central clock in our brain,

00:02:19.590 --> 00:02:21.720 to say, "It's day. It's night."

00:02:21.720 --> 00:02:23.280 And so it's a very layered,

00:02:23.280 --> 00:02:26.160 and I almost often say, networked control system.

00:02:26.160 --> 00:02:28.440 And so I think the traditional view of circadian

00:02:28.440 --> 00:02:32.370 is this top-down master clock tells everything what to do.

00:02:32.370 --> 00:02:34.170 And there's clocks in every cell of the body.

00:02:34.170 --> 00:02:36.270 What's becoming more and more apparent

00:02:36.270 --> 00:02:38.850 is that there's a lot of feedback in this network.

00:02:38.850 --> 00:02:41.580 When we eat and the clocks in the stomach

00:02:41.580 --> 00:02:42.570 see that we've eaten food,

00:02:42.570 --> 00:02:45.540 they say, "Hey, brain, it's morning, we're getting food."

00:02:45.540 --> 00:02:48.630 And so there's this sort of constant tug and pull

00:02:48.630 --> 00:02:51.049 between the clocks to orient the body.

00:02:53.880 --> 00:02:56.100 If you're thoughtful, you can move it, but it's hard.

00:02:56.100 --> 00:02:58.050 And so we have some biology,

00:02:58.050 --> 00:03:00.540 we also have the sum total of all the signals.

00:03:00.540 --> 00:03:02.580 And so, obviously, sunlight is really powerful.

00:03:02.580 --> 00:03:04.560 And so if you endeavor to trick your body

00:03:04.560 --> 00:03:07.200 into thinking that night is day and day is night,

00:03:07.200 --> 00:03:10.230 you need to do a lot of careful planning  
 00:03:10.230 --> 00:03:11.760 around the fact that there's sun outside.  
 00:03:11.760 --> 00:03:14.400 All of us have deadlines and work late.  
 00:03:14.400 --> 00:03:19.020 We all have jet lag and travel.  
 00:03:19.020 --> 00:03:20.970 All these things are common.  
 00:03:20.970 --> 00:03:24.030 And really, shift work is referring to the idea  
 00:03:24.030 --> 00:03:27.240 that you are trying to work when your body wants  
 to sleep.  
 00:03:27.240 --> 00:03:29.190 You're trying to work during that biologic night  
 00:03:29.190 --> 00:03:32.220 and you're trying to sleep during biologic day  
 00:03:32.220 --> 00:03:34.470 when your circadian system is on and alerting.  
 00:03:34.470 --> 00:03:37.296 And so neither of those work very well.  
 00:03:37.296 --> 00:03:38.610 So if you can imagine, I said,  
 00:03:38.610 --> 00:03:41.970 well, if you wanna work at night and you're a day  
 person  
 00:03:41.970 --> 00:03:43.620 and you've got your regular sleep schedule  
 00:03:43.620 --> 00:03:44.790 and you've got it all worked out,  
 00:03:44.790 --> 00:03:48.360 and you say, "Okay, my sleep is 11:00 to 7:00,  
 00:03:48.360 --> 00:03:49.950 and I do it every day of my life,  
 00:03:49.950 --> 00:03:51.660 and I'm all set, I'm all regular.  
 00:03:51.660 --> 00:03:54.570 That's when my biologic night is, I have great  
 sleep."  
 00:03:54.570 --> 00:03:56.430 Okay, now, you need to work at night.  
 00:03:56.430 --> 00:04:00.180 You can then thoughtfully stay up later and later.  
 00:04:00.180 --> 00:04:01.920 And as you stay up later and later,  
 00:04:01.920 --> 00:04:03.540 you expose yourself to light,  
 00:04:03.540 --> 00:04:06.900 maybe you eat some late snacks, maybe a little  
 exercise,  
 00:04:06.900 --> 00:04:08.550 maybe you do some activities,  
 00:04:08.550 --> 00:04:10.740 and you can shift that 11:00 to 7:00  
 00:04:10.740 --> 00:04:14.070 to midnight to 8:00, to 1:00 to 9:00, and so on.  
 00:04:14.070 --> 00:04:15.450 It's easier for us.

00:04:15.450 --> 00:04:17.100 There's some, as you might guess,  
00:04:17.100 --> 00:04:18.900 some complexity underlying that.  
00:04:18.900 --> 00:04:20.640 It's easier for us to push later,  
00:04:20.640 --> 00:04:22.920 which is why, often, our folks  
00:04:22.920 --> 00:04:24.570 who are really savvy with shift work  
00:04:24.570 --> 00:04:27.240 know that you need to rotate, we call it rotating  
forward.  
00:04:27.240 --> 00:04:28.710 But you can stay up later and later,  
00:04:28.710 --> 00:04:31.620 expose yourself to those daytime zeitgebers,  
00:04:31.620 --> 00:04:33.810 the light, the feeding, the exercise.  
00:04:33.810 --> 00:04:37.110 Trick your body into pushing that circadian night  
later.  
00:04:37.110 --> 00:04:38.370 And when you do that,  
00:04:38.370 --> 00:04:41.850 you're able to work during what I call clock night,  
00:04:41.850 --> 00:04:44.580 and you're able to sleep during clock day  
00:04:44.580 --> 00:04:46.620 because you've pushed that biologic night  
00:04:46.620 --> 00:04:47.857 very intentionally.  
00:04:50.430 --> 00:04:53.280 Understanding that our behaviors create  
00:04:53.280 --> 00:04:56.790 this time period when we sleep better is really  
helpful.  
00:04:56.790 --> 00:04:57.660 And then understanding  
00:04:57.660 --> 00:04:59.940 that if we want to, and we're thoughtful, we can  
move it.  
00:04:59.940 --> 00:05:02.460 So if we say, "You know, I normally sleep this  
time.  
00:05:02.460 --> 00:05:03.870 I know I'm gonna sleep best."  
00:05:03.870 --> 00:05:04.740 And then say, "You know what?  
00:05:04.740 --> 00:05:06.150 I've got a night shift coming up.  
00:05:06.150 --> 00:05:08.610 I have an overnight, I have an evening shift coming  
up.  
00:05:08.610 --> 00:05:11.430 I'm gonna intentionally shift it."  
00:05:11.430 --> 00:05:12.330 And it's very intuitive.  
00:05:12.330 --> 00:05:13.560 It's the daytime activities,

00:05:13.560 --> 00:05:17.070 the light, the eating, the exercise, that can move it later.

00:05:17.070 --> 00:05:18.150 And so understanding that,

00:05:18.150 --> 00:05:20.460 at least, you can gain some advantages.

00:05:20.460 --> 00:05:21.840 But also when you can't sleep,

00:05:21.840 --> 00:05:24.130 you're not frustrated 'cause you know what's going on.