NASA
SPACESTATION
LIVE

1
00:00:08,209 --> 00:00:06,890
well if you think you're sleepy just

2
00:00:10,370 --> 00:00:08,219
because you're still trying to adjust a

3
00:00:12,560 --> 00:00:10,380
daylight savings time imagine having to

4
00:00:15,020 --> 00:00:12,570
see 16 sunrises a day that can really

5
00:00:16,519 --> 00:00:15,030
turn your sleep off and throw it off and

6
00:00:18,859 --> 00:00:16,529
the lack of sleep can really affect our

7
00:00:20,929 --> 00:00:18,869
health and our overall job performance

8
00:00:22,579 --> 00:00:20,939
that's why it is vital to understand the

9
00:00:24,349 --> 00:00:22,589
sleep patterns in astronauts because

10
00:00:26,149 --> 00:00:24,359
they're in such high-performance jobs

11
00:00:30,290 --> 00:00:26,159
and they really need a good night's

12
00:00:33,200 --> 00:00:30,300
sleep we like to say that sleep is the

13
00:00:35,959 --> 00:00:33,210

third pillar of health so not only is

14
00:00:38,360 --> 00:00:35,969
diet and exercise important but also

15
00:00:40,849 --> 00:00:38,370
sleep and that's not just for your

16
00:00:44,180 --> 00:00:40,859
performance but also for health reasons

17
00:00:46,340 --> 00:00:44,190
we know that when people sleep six hours

18
00:00:50,000 --> 00:00:46,350
or less a night they're more likely to

19
00:00:53,900 --> 00:00:50,010
be obese have diabetes have adverse

20
00:00:56,509 --> 00:00:53,910
cardiovascular outcomes so we're

21
00:00:59,930 --> 00:00:56,519
interested in learning about how much

22
00:01:01,189 --> 00:00:59,940
astronauts sleep in space and if they're

23
00:01:04,310 --> 00:01:01,199
not getting enough sleep

24
00:01:07,070 --> 00:01:04,320
what countermeasures are available to

25
00:01:10,010 --> 00:01:07,080
help promote sleep in space and some

26
00:01:12,200 --> 00:01:10,020
people like to tie themselves but I

27
00:01:14,600 --> 00:01:12,210
actually don't I only like to just float

28
00:01:17,930 --> 00:01:14,610
when I'm sleeping so that's really it I

29
00:01:20,030 --> 00:01:17,940
would turn the light off and goodnight

30
00:01:23,000 --> 00:01:20,040
we really don't think about it but I

31
00:01:25,850 --> 00:01:23,010
guess it's a little awkward sleeping in

32
00:01:28,550 --> 00:01:25,860
space right right it's still a pretty

33
00:01:31,040 --> 00:01:28,560
harsh environment for sleep on the

34
00:01:33,980 --> 00:01:31,050
International Space Station astronauts

35
00:01:37,550 --> 00:01:33,990
have told us that sometimes it's too hot

36
00:01:39,440 --> 00:01:37,560
or too cold or too noisy this is how we

37
00:01:41,660 --> 00:01:39,450
sleep aboard the space station this is

38
00:01:44,240 --> 00:01:41,670

called a crew quarters or a sleep

39
00:01:47,480 --> 00:01:44,250
station and this is where I sleep every

40
00:01:51,440 --> 00:01:47,490
night they also have a light dark cycle

41
00:01:53,810 --> 00:01:51,450
that is 90 minutes long rather than the

42
00:01:57,190 --> 00:01:53,820
24-hour light dark cycle we have on

43
00:02:02,060 --> 00:01:57,200
earth and so that can if light is

44
00:02:04,940 --> 00:02:02,070
insufficiently intense or mistimed then

45
00:02:08,119 --> 00:02:04,950
you can have circadian misalignment and

46
00:02:11,060 --> 00:02:08,129
so what does that mean so normally our

47
00:02:12,930 --> 00:02:11,070
sleep/wake schedule is synchronized to

48
00:02:16,110 --> 00:02:12,940
the Earth's light dark cycle

49
00:02:20,040 --> 00:02:16,120
and so when we are awake during the day

50
00:02:21,960 --> 00:02:20,050
and sleep at night it's easy to sleep

51
00:02:24,390 --> 00:02:21,970
our body wants us to sleep and we go to

52
00:02:27,120 --> 00:02:24,400
sleep at night on the space station

53
00:02:30,150 --> 00:02:27,130
sometimes they have abrupt changes in

54
00:02:33,420 --> 00:02:30,160
their sleep wake cycle that causes their

55
00:02:35,730 --> 00:02:33,430
circadian system to become misaligned we

56
00:02:38,640 --> 00:02:35,740
know from our previous work on the space

57
00:02:41,040 --> 00:02:38,650
station that on those times when the

58
00:02:44,460 --> 00:02:41,050
circadian system is misaligned

59
00:02:47,520 --> 00:02:44,470
they sleep about an hour less and they

60
00:02:50,220 --> 00:02:47,530
use more sleep promoting medications so

61
00:02:53,340 --> 00:02:50,230
now we're really curious about how sleep

62
00:02:55,980 --> 00:02:53,350
is affected during the second six months

63
00:02:59,580 --> 00:02:55,990

of a year-long mission will sleep get

64
00:03:02,310 --> 00:02:59,590
better will it get worse we're just

65
00:03:04,620 --> 00:03:02,320
collecting those data right now how do

66
00:03:05,700 --> 00:03:04,630
you collect the data what is it we use

67
00:03:08,700 --> 00:03:05,710
an actogram

68
00:03:11,130 --> 00:03:08,710
to collect the data it's similar to what

69
00:03:14,550 --> 00:03:11,140
you see commercially available a Fitbit

70
00:03:17,520 --> 00:03:14,560
or a jawbone or one of those this

71
00:03:20,130 --> 00:03:17,530
actigraph is a bit harder and it's

72
00:03:24,090 --> 00:03:20,140
scientifically validated with algorithms

73
00:03:27,120 --> 00:03:24,100
that estimate sleep it also gives us

74
00:03:30,020 --> 00:03:27,130
light exposure information and we can

75
00:03:33,990 --> 00:03:30,030
feed that sleep and light information

76
00:03:36,660 --> 00:03:34,000
into a mathematical model that estimates

77
00:03:39,000 --> 00:03:36,670
circadian phase so we know whether the

78
00:03:42,030 --> 00:03:39,010
astronaut is aligned or misaligned

79
00:03:44,910 --> 00:03:42,040
circadian lee the ultimate goal of the

80
00:03:48,000 --> 00:03:44,920
study is to find ways for crew members

81
00:03:51,690 --> 00:03:48,010
to sleep better in space to be able to

82
00:03:55,860 --> 00:03:51,700
obtain more sleep just like we study

83
00:03:58,860 --> 00:03:55,870
here on earth different occupations that

84
00:04:00,600 --> 00:03:58,870
have unusual work hours and we like to

85
00:04:02,220 --> 00:04:00,610
see how their sleep is affected how

86
00:04:05,430 --> 00:04:02,230
their alertness performance and safety

87
00:04:08,070 --> 00:04:05,440
outcomes are affected by their work

88
00:04:10,610 --> 00:04:08,080

hours so we've studied police officers

89
00:04:13,440 --> 00:04:10,620
and firefighters federal air marshals

90
00:04:17,789 --> 00:04:13,450
resident physicians even the mission

91
00:04:19,979 --> 00:04:17,799
controllers here at NASA and evaluated

92
00:04:23,159 --> 00:04:19,989
fatigue countermeasures to keep them

93
00:04:25,320 --> 00:04:23,169
more alert during the work and label

94
00:04:26,140 --> 00:04:25,330
them to sleep better the information we

95
00:04:28,450 --> 00:04:26,150
collect today

96
00:04:30,189 --> 00:04:28,460
we'll be really important for future

97
00:04:32,920 --> 00:04:30,199
one-year missions or even longer

98
00:04:35,939 --> 00:04:32,930
missions because being able to obtain

99
00:04:38,290 --> 00:04:35,949
adequate sleep each night on these

100
00:04:39,820 --> 00:04:38,300
exploration missions is going to be very