1
00:00:08,390 --> 00:00:06,389
we've probably all stumbled or lost our

2
00:00:10,390 --> 00:00:08,400
balance at one time or another for space

3
00:00:11,749 --> 00:00:10,400
station astronauts it's a pretty common

4
00:00:13,749 --> 00:00:11,759
occurrence when they return to earth's

5
00:00:15,509 --> 00:00:13,759
gravity a study is now looking at

6
00:00:17,029 --> 00:00:15,519
astronauts vestibular systems that's

7
00:00:19,349 --> 00:00:17,039
part of your inner ear that controls

8
00:00:20,870 --> 00:00:19,359
balance to see why this happens and what

9
00:00:24,550 --> 00:00:20,880
they learn could help folks with those

10
00:00:26,230 --> 00:00:24,560
types of balance problems here on earth

11
00:00:27,750 --> 00:00:26,240
sitting down standing up it may not be

12
00:00:29,509 --> 00:00:27,760
as easy as you think for crew members

13
00:00:31,189 --> 00:00:29,519

coming back from the space station but

14
00:00:33,030 --> 00:00:31,199
there's a study 20 years in the making

15
00:00:35,030 --> 00:00:33,040
that's looking into that dr mill rescue

16
00:00:36,790 --> 00:00:35,040
joins us now tell us about this study

17
00:00:38,950 --> 00:00:36,800
first it was a pilot program now it's

18
00:00:40,470 --> 00:00:38,960
turning into a real investigation yes in

19
00:00:42,709 --> 00:00:40,480
cooperation with our russian

20
00:00:44,790 --> 00:00:42,719
counterparts we're looking at functional

21
00:00:47,029 --> 00:00:44,800
performance and one of the things that

22
00:00:49,270 --> 00:00:47,039
we're particularly interested in is how

23
00:00:51,750 --> 00:00:49,280
the vestibular system behaves the

24
00:00:54,790 --> 00:00:51,760
vestibular system being those organs in

25
00:00:57,270 --> 00:00:54,800
your inner ear that maintain

26
00:00:58,549 --> 00:00:57,280
your balance and help you see when your

27
00:01:01,270 --> 00:00:58,559
head is moving

28
00:01:03,750 --> 00:01:01,280
and because we're in the field doing

29
00:01:06,070 --> 00:01:03,760
this we can't ask somebody to walk for

30
00:01:07,750 --> 00:01:06,080
example on a treadmill and see how they

31
00:01:10,789 --> 00:01:07,760
can read while they walk

32
00:01:13,190 --> 00:01:10,799
so we simply bounce them up and down

33
00:01:14,710 --> 00:01:13,200
while they're trying to read a display

34
00:01:16,950 --> 00:01:14,720
tell us all about this gear though that

35
00:01:18,710 --> 00:01:16,960
she has on well we're looking at

36
00:01:20,789 --> 00:01:18,720
inertial sensors they're the ones that

37
00:01:22,469 --> 00:01:20,799
are blinking here that give us

38
00:01:25,830 --> 00:01:22,479

estimations of

39
00:01:28,469 --> 00:01:25,840
the person's angular acceleration and

40
00:01:31,109 --> 00:01:28,479
the angles that they are experiencing

41
00:01:33,350 --> 00:01:31,119
relative to the ground we have

42
00:01:35,830 --> 00:01:33,360
cardiovascular parameters that we

43
00:01:37,429 --> 00:01:35,840
measure heart rate and blood pressure

44
00:01:40,630 --> 00:01:37,439
as well as

45
00:01:43,030 --> 00:01:40,640
emg from the legs and so when a crew

46
00:01:45,030 --> 00:01:43,040
member once they get out of the soyuz

47
00:01:46,230 --> 00:01:45,040
then they suit up in this

48
00:01:48,789 --> 00:01:46,240
immediately

49
00:01:51,510 --> 00:01:48,799
they're taken to the to the

50
00:01:53,510 --> 00:01:51,520
medical tents and

51
00:01:56,950 --> 00:01:53,520
right away we start putting the hardware

52
00:01:58,630 --> 00:01:56,960
on them and doing the uh testing so he

53
00:02:00,310 --> 00:01:58,640
got here was was bouncing her up and

54
00:02:02,950 --> 00:02:00,320
down so what is that for

55
00:02:06,389 --> 00:02:02,960
what what what does this simulate

56
00:02:08,469 --> 00:02:06,399
this simulates walking okay and

57
00:02:09,430 --> 00:02:08,479
it also is in a plane

58
00:02:11,350 --> 00:02:09,440
that

59
00:02:13,670 --> 00:02:11,360
you expect to see

60
00:02:15,910 --> 00:02:13,680
as as you walk and

61
00:02:18,630 --> 00:02:15,920
is probably going to be less provocative

62
00:02:20,630 --> 00:02:18,640
than doing some other kind of a test of

63
00:02:22,710 --> 00:02:20,640

the inner ear organs and we're talking

64
00:02:25,110 --> 00:02:22,720
about this with crew members but this is

65
00:02:27,350 --> 00:02:25,120
helping folks on earth too absolutely

66
00:02:28,150 --> 00:02:27,360
we're dealing with an aging population

67
00:02:31,910 --> 00:02:28,160
now

68
00:02:34,229 --> 00:02:31,920
and countermeasures for the kinds of of

69
00:02:36,949 --> 00:02:34,239
difficulty that they experience

70
00:02:39,430 --> 00:02:36,959
is what's really needed quite frankly

71
00:02:40,710 --> 00:02:39,440
crew members are not terribly stable on

72
00:02:43,110 --> 00:02:40,720
their feet

73
00:02:46,229 --> 00:02:43,120
jack schmidt having a few problems we

74
00:02:49,589 --> 00:02:46,239
saw several times if you recall the moon

75
00:02:52,790 --> 00:02:49,599
flights where the crew members fell down

76
00:02:54,070 --> 00:02:52,800
and we're actually preparing for that by

77
00:02:56,790 --> 00:02:54,080
measuring

78
00:02:58,869 --> 00:02:56,800
recovery from a fall so we simulate a

79
00:03:01,430 --> 00:02:58,879
person that has fallen down

80
00:03:03,509 --> 00:03:01,440
and asked them to stand up

81
00:03:05,270 --> 00:03:03,519
and once because we get to mars there's

82
00:03:10,309 --> 00:03:05,280
nobody there

83
00:03:11,750 --> 00:03:10,319
once they're standing they stay standing

84
00:03:13,910 --> 00:03:11,760
for three minutes

85
00:03:16,630 --> 00:03:13,920
this this allows us to

86
00:03:19,830 --> 00:03:16,640
look at the cardiovascular parameters in

87
00:03:24,309 --> 00:03:19,840
terms of feigning for example all right

88
00:03:28,070 --> 00:03:26,149

oh that's better than i could do

89
00:03:29,990 --> 00:03:28,080
and so you stand there for three minutes

90
00:03:32,789 --> 00:03:30,000
and that tells you what

91
00:03:33,830 --> 00:03:32,799
we're looking constantly at position of

92
00:03:38,630 --> 00:03:33,840
the body

93
00:03:40,789 --> 00:03:38,640
sway how much they're moving as well as

94
00:03:43,589 --> 00:03:40,799
heart rate and blood pressure

95
00:03:45,030 --> 00:03:43,599
so how many tasks do we look at how many

96
00:03:47,910 --> 00:03:45,040
little exercises do they have to go

97
00:03:50,470 --> 00:03:47,920
through we have between 12 and 13

98
00:03:51,910 --> 00:03:50,480
including the russian activity that we

99
00:03:54,470 --> 00:03:51,920
we engage in

100
00:03:56,630 --> 00:03:54,480
okay and so you have one more for me one

101
00:04:00,309 --> 00:03:56,640
more for you you're going to do

102
00:04:01,670 --> 00:04:00,319
what's called a tandem heel to toe walk

103
00:04:04,390 --> 00:04:01,680
which

104
00:04:07,110 --> 00:04:04,400
we do with the eyes closed and the eyes

105
00:04:09,030 --> 00:04:07,120
open wow i've never done this one before

106
00:04:10,869 --> 00:04:09,040
promise i promise mom

107
00:04:12,869 --> 00:04:10,879
all right so

108
00:04:15,030 --> 00:04:12,879
cross my arms cross your arms close my

109
00:04:17,349 --> 00:04:15,040
eyes heel to toe

110
00:04:20,469 --> 00:04:18,949
see i have no balance and i've not even

111
00:04:23,030 --> 00:04:20,479
been

112
00:04:25,030 --> 00:04:23,040
in space so so what's the point of this

113
00:04:30,310 --> 00:04:25,040

the point of this is that this

114
00:04:35,350 --> 00:04:32,710
neurological function

115
00:04:38,310 --> 00:04:35,360
as a whole you know okay from

116
00:04:40,230 --> 00:04:38,320
the brain on down to the feet

117
00:04:41,350 --> 00:04:40,240
well mine apparently doesn't go together

118
00:04:44,790 --> 00:04:41,360
so

119
00:04:47,430 --> 00:04:44,800
and uh you did

120
00:04:49,350 --> 00:04:47,440
better than some astronauts