
PAO

1
00:00:04,870 --> 00:00:03,189
astronauts who live and work for long

2
00:00:06,950 --> 00:00:04,880
periods of time in the weightless

3
00:00:08,629 --> 00:00:06,960
environment of space suffer the loss of

4
00:00:10,470 --> 00:00:08,639
some bone and muscle strength since

5
00:00:11,589 --> 00:00:10,480
their bones and muscles have much less

6
00:00:13,190 --> 00:00:11,599
work to do

7
00:00:15,110 --> 00:00:13,200
nasa scientists have been working to

8
00:00:17,510 --> 00:00:15,120
find countermeasures to keep astronauts

9
00:00:19,029 --> 00:00:17,520
fit and strong one of those experiments

10
00:00:21,349 --> 00:00:19,039
underway on board the international

11
00:00:23,509 --> 00:00:21,359
space station is called sprint recently

12
00:00:26,310 --> 00:00:23,519
i spoke with the principal investigator

13
00:00:29,029 --> 00:00:26,320

dr laurie ploutz snyder and i asked her

14
00:00:31,509 --> 00:00:29,039
to describe what sprint is investigating

15
00:00:33,590 --> 00:00:31,519
so sprint is an exercise program that

16
00:00:35,910 --> 00:00:33,600
we're testing on the space station that

17
00:00:38,310 --> 00:00:35,920
is evaluating the use of higher

18
00:00:40,389 --> 00:00:38,320
intensity but lower duration and

19
00:00:41,830 --> 00:00:40,399
frequency exercises

20
00:00:44,630 --> 00:00:41,840
and we're looking to protect the

21
00:00:46,630 --> 00:00:44,640
cardiovascular system so aerobic fitness

22
00:00:48,950 --> 00:00:46,640
and skeletal muscle strength and

23
00:00:51,430 --> 00:00:48,960
endurance and muscle fitness and also

24
00:00:53,350 --> 00:00:51,440
bone health okay so let's talk about the

25
00:00:55,670 --> 00:00:53,360
space gym it is

26
00:00:57,750 --> 00:00:55,680
got three main pieces of equipment up

27
00:01:00,310 --> 00:00:57,760
there we have the treadmill we have the

28
00:01:02,470 --> 00:01:00,320
stationary bicycle and we also have that

29
00:01:04,469 --> 00:01:02,480
resistive exercise device that simulates

30
00:01:05,670 --> 00:01:04,479
weight lifting here on it so it's for

31
00:01:07,750 --> 00:01:05,680
strength training

32
00:01:09,750 --> 00:01:07,760
so all three of those um pieces of

33
00:01:12,230 --> 00:01:09,760
equipment are being used for crew

34
00:01:15,109 --> 00:01:12,240
members who are on the

35
00:01:16,870 --> 00:01:15,119
sprint program and the others are also

36
00:01:18,950 --> 00:01:16,880
using it as well so can you tell me

37
00:01:20,950 --> 00:01:18,960
what's the difference sure everyone uses

38
00:01:22,870 --> 00:01:20,960

the same equipment the bicycle the

39
00:01:26,070 --> 00:01:22,880
treadmill and the weightlifting the

40
00:01:27,749 --> 00:01:26,080
sprint participants do a special program

41
00:01:29,990 --> 00:01:27,759
where they do the weightlifting three

42
00:01:32,230 --> 00:01:30,000
days a week instead of the usual six

43
00:01:34,390 --> 00:01:32,240
days a week so they're doing half the

44
00:01:37,109 --> 00:01:34,400
number of sessions but the sessions that

45
00:01:39,590 --> 00:01:37,119
they do do are harder workouts

46
00:01:41,429 --> 00:01:39,600
and then for the aerobic exercise they

47
00:01:43,030 --> 00:01:41,439
can switch off between the treadmill and

48
00:01:44,789 --> 00:01:43,040
the cycle we like them to use the

49
00:01:46,950 --> 00:01:44,799
treadmill at least two-thirds of the

50
00:01:49,749 --> 00:01:46,960
time is the recommendation

51
00:01:51,109 --> 00:01:49,759
and for that they do special exercise

52
00:01:53,270 --> 00:01:51,119
protocols we have four different

53
00:01:56,069 --> 00:01:53,280
protocols that they switch off between

54
00:01:57,990 --> 00:01:56,079
one is as short as 30 second intervals

55
00:02:00,310 --> 00:01:58,000
so the whole workout is only eight or

56
00:02:02,149 --> 00:02:00,320
nine minutes including the warm-up

57
00:02:04,389 --> 00:02:02,159
and then there's uh two minute intervals

58
00:02:05,510 --> 00:02:04,399
four minute intervals and a half an hour

59
00:02:08,550 --> 00:02:05,520
continuous

60
00:02:10,790 --> 00:02:08,560
so shorter high intensity versus the

61
00:02:12,550 --> 00:02:10,800
longer low intensity exactly

62
00:02:14,869 --> 00:02:12,560
the prescribed so where did where did

63
00:02:17,830 --> 00:02:14,879

the idea come from the idea from this

64
00:02:20,070 --> 00:02:17,840
came actually from about 20 years of

65
00:02:23,589 --> 00:02:20,080
ground research much of which was funded

66
00:02:25,750 --> 00:02:23,599
by nasa and 50 years of exercise

67
00:02:27,910 --> 00:02:25,760
experience in space flight and we

68
00:02:30,470 --> 00:02:27,920
brought all of that we had learned from

69
00:02:31,990 --> 00:02:30,480
all of these things together to look at

70
00:02:33,910 --> 00:02:32,000
what do we think would be the most

71
00:02:36,470 --> 00:02:33,920
effective and the most efficient

72
00:02:38,309 --> 00:02:36,480
exercise program okay so have we done

73
00:02:41,589 --> 00:02:38,319
any of the um

74
00:02:43,030 --> 00:02:41,599
the the kind of the sprint protocol

75
00:02:44,710 --> 00:02:43,040
here on earth with any of the crew

76
00:02:46,390 --> 00:02:44,720
members before they go

77
00:02:49,030 --> 00:02:46,400
how does that work yeah so any of the

78
00:02:51,190 --> 00:02:49,040
crew members who sign up for sprint

79
00:02:52,790 --> 00:02:51,200
they get to practice these protocols on

80
00:02:54,229 --> 00:02:52,800
the ground to make sure that they like

81
00:02:55,750 --> 00:02:54,239
on them and that they know how to do

82
00:02:57,670 --> 00:02:55,760
them and that this is going to work for

83
00:02:59,509 --> 00:02:57,680
them because if you haven't done these

84
00:03:01,910 --> 00:02:59,519
high intensity intervals before it takes

85
00:03:03,030 --> 00:03:01,920
a little getting used to okay sure

86
00:03:05,190 --> 00:03:03,040
all right so

87
00:03:06,550 --> 00:03:05,200
um overall are there any we know the

88
00:03:07,670 --> 00:03:06,560

health benefits for bone and muscle

89
00:03:09,589 --> 00:03:07,680
that's what we've been looking at are

90
00:03:11,350 --> 00:03:09,599
there any other benefits that that they

91
00:03:14,149 --> 00:03:11,360
could possibly we're seeing a lot of

92
00:03:17,030 --> 00:03:14,159
benefits for cardiovascular fitness so

93
00:03:19,750 --> 00:03:17,040
the heart and the breathing and the

94
00:03:21,830 --> 00:03:19,760
overall endurance okay very interesting

95
00:03:24,630 --> 00:03:21,840
and so i understand this experiments

96
00:03:26,789 --> 00:03:24,640
running through expedition 44

97
00:03:28,710 --> 00:03:26,799
what do you hope to be able to offer

98
00:03:30,309 --> 00:03:28,720
crew members after this

99
00:03:32,470 --> 00:03:30,319
really there's two main things we hope

100
00:03:34,869 --> 00:03:32,480
to offer one is an optimized

101
00:03:35,990 --> 00:03:34,879
prescription that can be used on station

102
00:03:38,149 --> 00:03:36,000
for

103
00:03:40,390 --> 00:03:38,159
different durations so six months 12

104
00:03:43,190 --> 00:03:40,400
months if we ever do anything longer so

105
00:03:45,670 --> 00:03:43,200
we hope to deliver an optimized exercise

106
00:03:48,149 --> 00:03:45,680
prescription but equally as important we

107
00:03:50,470 --> 00:03:48,159
hope to learn a lot about why the

108
00:03:52,949 --> 00:03:50,480
exercise program works and what parts

109
00:03:55,750 --> 00:03:52,959
work in different ways so that we can

110
00:03:58,070 --> 00:03:55,760
recommend exercise programs for our next

111
00:04:00,550 --> 00:03:58,080
missions our long-duration exploration

112
00:04:02,949 --> 00:04:00,560
missions and also

113
00:04:05,509 --> 00:04:02,959

to know what requirements we need for

114
00:04:07,270 --> 00:04:05,519
the next generation of exercise hardware

115
00:04:09,429 --> 00:04:07,280
so the exercise equipment that goes to

116
00:04:11,589 --> 00:04:09,439
mars will probably look a lot different

117
00:04:13,110 --> 00:04:11,599
than today's equipment and do we have

118
00:04:15,910 --> 00:04:13,120
any um

119
00:04:18,469 --> 00:04:15,920
results back are we seeing anything well

120
00:04:20,870 --> 00:04:18,479
we've had five crew members complete the

121
00:04:23,270 --> 00:04:20,880
sprint active program that that's this

122
00:04:26,230 --> 00:04:23,280
new high-intensity prescription and

123
00:04:28,710 --> 00:04:26,240
they're doing very well so far so

124
00:04:30,790 --> 00:04:28,720
it's meeting our expectations

125
00:04:32,070 --> 00:04:30,800
uh the feedback has been good

126
00:04:35,189 --> 00:04:32,080
some of the crew members say it's a

127
00:04:36,950 --> 00:04:35,199
pretty tough workout yeah but um we have

128
00:04:38,950 --> 00:04:36,960
it spaced so that there are recovery

129
00:04:41,909 --> 00:04:38,960
periods in between and i would imagine

130
00:04:44,070 --> 00:04:41,919
as well that with the shorter durations

131
00:04:45,270 --> 00:04:44,080
the high intensity that that allows more

132
00:04:48,230 --> 00:04:45,280
crew time

133
00:04:50,310 --> 00:04:48,240
for other activities or it could i mean

134
00:04:52,230 --> 00:04:50,320
instead of every day long duration you

135
00:04:55,110 --> 00:04:52,240
know the whole two-hour

136
00:04:56,870 --> 00:04:55,120
exercise session so um also do you feel

137
00:04:59,189 --> 00:04:56,880
that any of your research that you're

138
00:05:01,749 --> 00:04:59,199

doing in this study is um

139
00:05:04,310 --> 00:05:01,759
going to apply how will it apply to us

140
00:05:06,390 --> 00:05:04,320
here on earth for for people maybe

141
00:05:08,550 --> 00:05:06,400
um who are suffering from osteoporosis

142
00:05:09,990 --> 00:05:08,560
or anything like that yeah sure

143
00:05:12,150 --> 00:05:10,000
so a lot of the things we're learning

144
00:05:13,830 --> 00:05:12,160
scientifically will

145
00:05:16,150 --> 00:05:13,840
help with the understanding of

146
00:05:18,390 --> 00:05:16,160
physiology but from the practical point

147
00:05:20,550 --> 00:05:18,400
of view we would all love a very

148
00:05:23,029 --> 00:05:20,560
effective short workout that we could

149
00:05:25,350 --> 00:05:23,039
get in during our lunch time or by not

150
00:05:27,270 --> 00:05:25,360
taking up a whole lot of our day and so

151
00:05:28,870 --> 00:05:27,280
there's a lot of

152
00:05:31,430 --> 00:05:28,880
a lot of interest out there in the

153
00:05:33,110 --> 00:05:31,440
regular community for what is the most

154
00:05:35,110 --> 00:05:33,120
efficient workout that would give you

155
00:05:37,430 --> 00:05:35,120
great benefits without a lot of time

156
00:05:39,830 --> 00:05:37,440
correct great well it's all very very

157
00:05:41,350 --> 00:05:39,840
interesting i love the the you know the

158
00:05:42,790 --> 00:05:41,360
health and fitness is obviously very

159
00:05:45,029 --> 00:05:42,800
important to us here on earth but it's

160
00:05:46,310 --> 00:05:45,039
more so for uh crew members who are

161
00:05:47,749 --> 00:05:46,320
there aboard the international space

162
00:05:49,510 --> 00:05:47,759
station so thanks so much for coming out