1
00:00:05,829 --> 00:00:03,590
we are talking exercise at a really fast

2
00:00:07,590 --> 00:00:05,839
pace it's called sprint and i recently

3
00:00:10,790 --> 00:00:07,600
talked to the principal investigator

4
00:00:13,110 --> 00:00:10,800
about this high intensity research

5
00:00:15,990 --> 00:00:13,120
the flight study that i'm in charge of

6
00:00:18,390 --> 00:00:16,000
right now is called the sprint study and

7
00:00:21,510 --> 00:00:18,400
we call it sprint because the goal of

8
00:00:24,470 --> 00:00:21,520
the study is to evaluate higher

9
00:00:26,310 --> 00:00:24,480
intensity exercise programs

10
00:00:28,390 --> 00:00:26,320
for the protection of cardiovascular

11
00:00:30,630 --> 00:00:28,400
muscle and bone health

12
00:00:31,910 --> 00:00:30,640
on long duration spaceflight so how do

13
00:00:33,750 --> 00:00:31,920

we do that

14
00:00:35,270 --> 00:00:33,760
well we do what we're testing that's

15
00:00:37,030 --> 00:00:35,280
what we want to find out is how do we do

16
00:00:39,750 --> 00:00:37,040
that what we're testing

17
00:00:42,229 --> 00:00:39,760
is a unique way to combine aerobic

18
00:00:44,950 --> 00:00:42,239
exercise which is cycle and treadmill

19
00:00:46,310 --> 00:00:44,960
exercise with resistance exercise or

20
00:00:49,190 --> 00:00:46,320
weight lifting

21
00:00:51,830 --> 00:00:49,200
so we have the crew members exercising

22
00:00:54,069 --> 00:00:51,840
six days a week on either the

23
00:00:55,270 --> 00:00:54,079
t2 which is the treadmill or the sevis

24
00:00:57,670 --> 00:00:55,280
the cycle

25
00:01:00,470 --> 00:00:57,680
and at least three of those days a week

26
00:01:02,150 --> 00:01:00,480
they do high intensity intervals

27
00:01:04,390 --> 00:01:02,160
so that's where you work at a really

28
00:01:05,670 --> 00:01:04,400
high intensity but for a very short time

29
00:01:07,590 --> 00:01:05,680
because you couldn't do that for a very

30
00:01:10,230 --> 00:01:07,600
long time right

31
00:01:13,270 --> 00:01:10,240
so that's as opposed to

32
00:01:15,270 --> 00:01:13,280
going two hours at a slow speed or

33
00:01:17,429 --> 00:01:15,280
something like that so short high

34
00:01:19,270 --> 00:01:17,439
intensity sprint exercises really are

35
00:01:21,670 --> 00:01:19,280
sprinting really are sprinting and you

36
00:01:24,710 --> 00:01:21,680
really can sprint in space wow

37
00:01:27,590 --> 00:01:24,720
and then alternate days they're doing a

38
00:01:31,109 --> 00:01:27,600

red workouts with

39
00:01:33,749 --> 00:01:31,119
high loads and lower repetitions

40
00:01:35,830 --> 00:01:33,759
for the the weightlifting portion so

41
00:01:38,550 --> 00:01:35,840
what can we learn by by doing this type

42
00:01:40,870 --> 00:01:38,560
of research in a faster way yes so what

43
00:01:43,270 --> 00:01:40,880
we're trying we have two goals the the

44
00:01:45,990 --> 00:01:43,280
number one goal is to improve the

45
00:01:48,870 --> 00:01:46,000
efficacy of the exercise countermeasures

46
00:01:51,109 --> 00:01:48,880
so we have new x relatively new exercise

47
00:01:54,069 --> 00:01:51,119
hardware with a red and t2 they were

48
00:01:55,910 --> 00:01:54,079
launched in about 2009-ish

49
00:01:57,990 --> 00:01:55,920
and for the first time

50
00:02:00,789 --> 00:01:58,000
we have exercise equipment on station

51
00:02:03,510 --> 00:02:00,799
that allows for high-intensity exercise

52
00:02:06,069 --> 00:02:03,520
so the treadmill can go fast

53
00:02:08,710 --> 00:02:06,079
the a-red you can lift loads up to 600

54
00:02:11,830 --> 00:02:08,720
pounds and so now we're really using the

55
00:02:14,229 --> 00:02:11,840
station to try to get a handle on how do

56
00:02:16,309 --> 00:02:14,239
we best use this equipment we already

57
00:02:18,229 --> 00:02:16,319
know just the mere presence of the

58
00:02:20,710 --> 00:02:18,239
equipment the crew are doing better but

59
00:02:23,110 --> 00:02:20,720
we want to go from good to great with

60
00:02:25,990 --> 00:02:23,120
how specifically do you use this

61
00:02:27,750 --> 00:02:26,000
equipment for higher intensity exercise

62
00:02:30,470 --> 00:02:27,760
the other thing that we want to figure

63
00:02:33,270 --> 00:02:30,480

out for very long duration exploration

64
00:02:36,150 --> 00:02:33,280
missions is what do we really need in

65
00:02:37,830 --> 00:02:36,160
our exercise hardware so to help develop

66
00:02:39,830 --> 00:02:37,840
what do the crew members need to do to

67
00:02:42,470 --> 00:02:39,840
maintain their cardiovascular muscle and

68
00:02:44,470 --> 00:02:42,480
bone health so that we can also inform

69
00:02:46,470 --> 00:02:44,480
requirements for hardware for next

70
00:02:49,270 --> 00:02:46,480
generation equipment

71
00:02:51,350 --> 00:02:49,280
and get the most efficient exercise

72
00:02:53,110 --> 00:02:51,360
program

73
00:02:55,190 --> 00:02:53,120
would this have any effects on the

74
00:02:56,309 --> 00:02:55,200
equipment we use here on earth could it

75
00:02:57,990 --> 00:02:56,319
help with

76
00:03:01,110 --> 00:02:58,000
could it help me get through a sprint

77
00:03:03,110 --> 00:03:01,120
session or a spinning session well

78
00:03:05,270 --> 00:03:03,120
yes one way

79
00:03:07,509 --> 00:03:05,280
is that high intensity exercise programs

80
00:03:10,149 --> 00:03:07,519
are getting very popular on earth with

81
00:03:12,790 --> 00:03:10,159
crossfit and a lot of these programs

82
00:03:14,390 --> 00:03:12,800
that are out there and very popular

83
00:03:17,430 --> 00:03:14,400
the other thing is efficiency of

84
00:03:21,430 --> 00:03:19,910
everyone wants a quicker exercise

85
00:03:23,350 --> 00:03:21,440
program that they can squeeze in during

86
00:03:26,070 --> 00:03:23,360
their lunch hour or when they're busy

87
00:03:27,270 --> 00:03:26,080
and so the high intensity intervals may

88
00:03:29,430 --> 00:03:27,280

be a good

89
00:03:31,750 --> 00:03:29,440
a good route to go there one of our

90
00:03:33,750 --> 00:03:31,760
exercise protocols in the study is only

91
00:03:36,550 --> 00:03:33,760
30 seconds

92
00:03:39,350 --> 00:03:36,560
of exercise 15 seconds of rest repeated

93
00:03:41,509 --> 00:03:39,360
eight times so it's about a 15 minute

94
00:03:43,670 --> 00:03:41,519
workout it's not going to work out it's

95
00:03:45,830 --> 00:03:43,680
really hard though

96
00:03:48,070 --> 00:03:45,840
it's a hard 15 minutes but it's very

97
00:03:51,350 --> 00:03:48,080
efficient use of your time

98
00:03:54,390 --> 00:03:51,360
we have a sister study to sprint that is

99
00:03:57,030 --> 00:03:54,400
a similar exercise program in bed rest

100
00:03:59,830 --> 00:03:57,040
and we're doing that at the utmb in

101
00:04:03,350 --> 00:03:59,840
galveston and that we can enroll

102
00:04:05,110 --> 00:04:03,360
subjects far faster so we hope to be

103
00:04:07,110 --> 00:04:05,120
able to apply some of the results we

104
00:04:09,589 --> 00:04:07,120
learned from that here in the next year

105
00:04:11,910 --> 00:04:09,599
or so into the help inform the flight

106
00:04:14,229 --> 00:04:11,920
study we've already seen some

107
00:04:17,110 --> 00:04:14,239
preliminary results from our bed rest

108
00:04:20,390 --> 00:04:17,120
and our flight study that

109
00:04:23,749 --> 00:04:20,400
make us very optimistic that this will

110
00:04:26,070 --> 00:04:23,759
be a good exercise program and

111
00:04:28,070 --> 00:04:26,080
and someone who knows all too well about

112
00:04:29,430 --> 00:04:28,080
staying fit in space is astronaut tj

113
00:04:30,629 --> 00:04:29,440

creamer you spent a little time on the

114
00:04:32,550 --> 00:04:30,639
space station tell us about the

115
00:04:33,909 --> 00:04:32,560
exercises that you did while you were in

116
00:04:35,830 --> 00:04:33,919
space

117
00:04:38,230 --> 00:04:35,840
exercise is very important to us just

118
00:04:39,990 --> 00:04:38,240
from a relief standpoint

119
00:04:41,670 --> 00:04:40,000
and we have several available

120
00:04:42,390 --> 00:04:41,680
cardio-wise we're doing a running on

121
00:04:44,230 --> 00:04:42,400
treadmill

122
00:04:45,430 --> 00:04:44,240
we're bicycling on a stationary bicycle

123
00:04:47,350 --> 00:04:45,440
and we're also weightlifting and

124
00:04:48,950 --> 00:04:47,360
weightlessness too is it really two

125
00:04:51,430 --> 00:04:48,960
hours a day though

126
00:04:53,430 --> 00:04:51,440
two hours of the day is is pretty fair

127
00:04:56,150 --> 00:04:53,440
when you put together about a 30 to 45

128
00:04:57,270 --> 00:04:56,160
minute run and a cleanup from that and

129
00:04:59,110 --> 00:04:57,280
then you're going to do your weight

130
00:05:00,629 --> 00:04:59,120
lifting and that takes a while so yeah

131
00:05:02,629 --> 00:05:00,639
two hours is about right

132
00:05:04,870 --> 00:05:02,639
uh describe how you adjusted physically

133
00:05:07,029 --> 00:05:04,880
once you returned from space the

134
00:05:08,629 --> 00:05:07,039
adjustment goes through several phases

135
00:05:10,710 --> 00:05:08,639
it's about a month

136
00:05:12,870 --> 00:05:10,720
per month on orbit total recovery so we

137
00:05:14,870 --> 00:05:12,880
landed in june i was competing in tennis

138
00:05:16,710 --> 00:05:14,880

in december and it felt pretty good then

139
00:05:18,469 --> 00:05:16,720
but in the first couple of weeks your

140
00:05:19,590 --> 00:05:18,479
inner ear your vestibular system is all

141
00:05:21,350 --> 00:05:19,600
screwed up

142
00:05:23,590 --> 00:05:21,360
it's been turned off basically and so

143
00:05:24,870 --> 00:05:23,600
coming back to the gravity environment

144
00:05:26,629 --> 00:05:24,880
your inner ear gets a little confused

145
00:05:28,629 --> 00:05:26,639
and that takes a while to get over

146
00:05:30,390 --> 00:05:28,639
so is that what keeps you motivated to

147
00:05:33,270 --> 00:05:30,400
do all this exercising in space two

148
00:05:35,270 --> 00:05:33,280
things really um for normal natural

149
00:05:36,390 --> 00:05:35,280
healthy recovery the fitter you are the

150
00:05:37,990 --> 00:05:36,400
better you're gonna have a chance and

151
00:05:39,270 --> 00:05:38,000
you get to recover faster and be

152
00:05:40,870 --> 00:05:39,280
stronger

153
00:05:42,629 --> 00:05:40,880
but really if you have an emergency

154
00:05:43,990 --> 00:05:42,639
descent where you have to leave station

155
00:05:45,590 --> 00:05:44,000
in a hurry you want to be as fit as

156
00:05:47,270 --> 00:05:45,600
possible because you're going to land

157
00:05:49,430 --> 00:05:47,280
someplace in the world not necessarily

158
00:05:51,430 --> 00:05:49,440
planned so you want to be as fit for

159
00:05:53,189 --> 00:05:51,440
survival and recovery so what do you

160
00:05:55,189 --> 00:05:53,199
think about this new sprint study that

161
00:05:57,590 --> 00:05:55,199
we've heard about i think it's wonderful

162
00:05:59,590 --> 00:05:57,600
to maximize the protocol what i'm trying

163
00:06:01,510 --> 00:05:59,600

to say is if we are already exercising

164
00:06:03,749 --> 00:06:01,520
two hours a day but we can do it less

165
00:06:06,230 --> 00:06:03,759
and still get the same benefits or more

166
00:06:08,469 --> 00:06:06,240
super that's a wonderful idea did you

167
00:06:09,270 --> 00:06:08,479
have any favorite exercises that you did

168
00:06:11,189 --> 00:06:09,280
um

169
00:06:12,070 --> 00:06:11,199
i enjoyed the weightlifting quite quite

170
00:06:14,150 --> 00:06:12,080
a bit

171
00:06:15,430 --> 00:06:14,160
the exercise program is very good i set

172
00:06:17,350 --> 00:06:15,440
a record

173
00:06:19,670 --> 00:06:17,360
at jsc for the leg press when i came

174
00:06:21,590 --> 00:06:19,680
back i reset it so that's really a

175
00:06:23,990 --> 00:06:21,600
testament to to the exercise program

176
00:06:25,350 --> 00:06:24,000
quality in itself but for the the cardio

177
00:06:27,189 --> 00:06:25,360
stuff the running and bicycling that's

178
00:06:28,150 --> 00:06:27,199
the time you get to watch a movie all

179
00:06:31,830 --> 00:06:28,160
right

180
00:06:33,670 --> 00:06:31,840
what what is your favorite sport on

181
00:06:35,510 --> 00:06:33,680
earth though oh it's it's pretty well

182
00:06:37,590 --> 00:06:35,520
known i think for our community i'm a

183
00:06:39,510 --> 00:06:37,600
big tennis buff that's right well i'll

184
00:06:41,670 --> 00:06:39,520
take you on in some sets a little later

185
00:06:43,270 --> 00:06:41,680
well let's right now before we leave tj

186
00:06:44,469 --> 00:06:43,280
let's go back and see and take a live

187
00:06:46,469 --> 00:06:44,479
look in the payload operations

188
00:06:48,629 --> 00:06:46,479

integration center where tj spends a lot

189
00:06:50,629 --> 00:06:48,639
of his time now as a payload operations

190
00:06:52,550 --> 00:06:50,639
director tj you've just come off console

191
00:06:54,070 --> 00:06:52,560
what's what's going on this week well

192
00:06:55,430 --> 00:06:54,080
several things of course we have three

193
00:06:57,110 --> 00:06:55,440
crew members up on board right now and

194
00:06:59,830 --> 00:06:57,120
chris cassidy isn't working in the u.s

195
00:07:01,189 --> 00:06:59,840
segment uh today today's wednesday we'll

196
00:07:02,870 --> 00:07:01,199
be working with the spheres those

197
00:07:04,469 --> 00:07:02,880
floating satellites that are

198
00:07:06,150 --> 00:07:04,479
trying to try to fly formation and

199
00:07:07,589 --> 00:07:06,160
that's the big focus in the moment all

200
00:07:09,990 --> 00:07:07,599
right well as we said they're in a

201
00:07:12,629 --> 00:07:10,000
backup room right now they will be

202
00:07:13,990 --> 00:07:12,639
back in their flight control room in

203
00:07:16,070 --> 00:07:14,000
less than a month maybe getting some

204
00:07:17,510 --> 00:07:16,080
upgrades so that'll do it from us here