1
00:00:35,790 --> 00:00:31,650
commander Brian O'Connor leaving a crew

2
00:00:38,280 --> 00:00:35,800
out launch day for sts 40 the first

3
00:00:42,119 --> 00:00:38,290
mission dedicated to studying the human

4
00:00:45,299 --> 00:00:42,129
body and microgravity in Colombia's

5
00:00:50,170 --> 00:00:45,309
cargo bay a reusable research facility

6
00:00:56,110 --> 00:00:52,930
a tunnel led crew members from

7
00:00:58,440 --> 00:00:56,120
Columbia's main cabin into the lab here

8
00:01:00,550 --> 00:00:58,450
they conducted a series of life sciences

9
00:01:03,880 --> 00:01:00,560
experiments designed by a team of

10
00:01:06,400 --> 00:01:03,890
international investigators studying an

11
00:01:09,640 --> 00:01:06,410
unprecedented detail on the body adapts

12
00:01:12,219 --> 00:01:09,650
to weightlessness how it reacts upon

13
00:01:16,120 --> 00:01:12,229

return and the mechanisms regulating

14
00:01:18,609 --> 00:01:16,130
these changes crew members took turns

15
00:01:20,800 --> 00:01:18,619
wearing a neck chamber to measure the

16
00:01:23,920 --> 00:01:20,810
response of receptors that help govern

17
00:01:25,930 --> 00:01:23,930
blood pressure the work seems to confirm

18
00:01:28,690 --> 00:01:25,940
that this blood pressure regulating

19
00:01:29,969 --> 00:01:28,700
system is impaired in space which might

20
00:01:32,620 --> 00:01:29,979
help explain the lightheadedness

21
00:01:36,430 --> 00:01:32,630
astronauts experience when they stand up

22
00:01:39,130 --> 00:01:36,440
after landing data was also gathered on

23
00:01:41,980 --> 00:01:39,140
variations in blood flow and flexibility

24
00:01:44,109 --> 00:01:41,990
of vessels in the leg this is thought to

25
00:01:45,430 --> 00:01:44,119
contribute to the body's inability to

26
00:01:49,900 --> 00:01:45,440
maintain normal blood pressure

27
00:01:51,400 --> 00:01:49,910
immediately upon return to Earth samples

28
00:01:53,620 --> 00:01:51,410
collected over the course of the

29
00:01:55,420 --> 00:01:53,630
nine-day flight are being analyzed to

30
00:01:57,399 --> 00:01:55,430
determine whether changes in hormone

31
00:02:02,310 --> 00:01:57,409
levels may be part of the reason bone

32
00:02:07,170 --> 00:02:04,740
time spent peddling a stationary bike

33
00:02:09,389 --> 00:02:07,180
served a dual purpose providing

34
00:02:12,000 --> 00:02:09,399
information on exercise capacity in

35
00:02:14,910 --> 00:02:12,010
microgravity as well as heart and lung

36
00:02:17,010 --> 00:02:14,920
functions the distribution of blood and

37
00:02:19,650 --> 00:02:17,020
the lungs did not appear to change has

38
00:02:24,030 --> 00:02:19,660

predicted a surprise scientists are

39
00:02:26,610 --> 00:02:24,040
currently evaluating a number of other

40
00:02:29,280 --> 00:02:26,620
studies tested the theory that visual

41
00:02:31,860 --> 00:02:29,290
perception in conjunction with changes

42
00:02:33,840 --> 00:02:31,870
in the inner ear contribute to motion

43
00:02:37,620 --> 00:02:33,850
sickness symptoms most people experience

44
00:02:39,660 --> 00:02:37,630
when traveling in space but measuring

45
00:02:42,900 --> 00:02:39,670
changes and even determining their

46
00:02:45,000 --> 00:02:42,910
causes is just the beginning according

47
00:02:47,400 --> 00:02:45,010
to mission specialist dr. Rhea Seddon

48
00:02:49,500 --> 00:02:47,410
what we really have to do is decide

49
00:02:51,030 --> 00:02:49,510
whether or not we have to reverse some

50
00:02:53,550 --> 00:02:51,040
of these changes whether we have to

51
00:02:55,530 --> 00:02:53,560
develop countermeasures for instance for

52
00:02:58,380 --> 00:02:55,540
the loss of calcium that we see from the

53
00:03:00,060 --> 00:02:58,390
bones the loss of fluid from the body of

54
00:03:03,509 --> 00:03:00,070
course this mission was for only nine

55
00:03:05,430 --> 00:03:03,519
days and you can never say that what

56
00:03:08,430 --> 00:03:05,440
happens in nine days is all that will

57
00:03:11,070 --> 00:03:08,440
happen in three years and going to Mars

58
00:03:13,320 --> 00:03:11,080
there's no way that you can evaluate the

59
00:03:15,630 --> 00:03:13,330
countermeasures that you develop they

60
00:03:17,400 --> 00:03:15,640
require a space station and that's why

61
00:03:21,180 --> 00:03:17,410
we think space station is so important

62
00:03:23,400 --> 00:03:21,190
for life sciences research wherever

63
00:03:25,740 --> 00:03:23,410

possible the research aboard Spacelab

64
00:03:28,440 --> 00:03:25,750
was done with an eye towards earthly

65
00:03:29,640 --> 00:03:28,450
applications there are a lot of people

66
00:03:31,170 --> 00:03:29,650
who don't regulate their blood pressure

67
00:03:33,120 --> 00:03:31,180
properly and they have high blood

68
00:03:34,199 --> 00:03:33,130
pressure what can we learn about the

69
00:03:36,600 --> 00:03:34,209
changes that take place in

70
00:03:38,699 --> 00:03:36,610
weightlessness about regulation that we

71
00:03:40,199 --> 00:03:38,709
can put to use here on the ground people

72
00:03:43,140 --> 00:03:40,209
as they get older or as they're

73
00:03:45,810 --> 00:03:43,150
bedridden tend to lose calcium from the

74
00:03:47,430 --> 00:03:45,820
bones what regulates that and how is it

75
00:03:49,470 --> 00:03:47,440
the same and how is it different from

76
00:03:52,080 --> 00:03:49,480
weightlessness and if we can counteract

77
00:03:54,509 --> 00:03:52,090
it for astronauts going to Mars perhaps

78
00:03:56,850 --> 00:03:54,519
we can counteract it in in women as they

79
00:03:58,390 --> 00:03:56,860
get older and developing osteoporosis so

80
00:04:00,280 --> 00:03:58,400
their variety of things the

81
00:04:05,050 --> 00:04:00,290
we hope to gain from the mission such as

82
00:04:06,970 --> 00:04:05,060
this space lab life sciences one the

83
00:04:10,149 --> 00:04:06,980
most comprehensive study of human

84
00:04:13,000 --> 00:04:10,159
adaptation ever undertaken enhancing our

85
00:04:16,629 --> 00:04:13,010
future both in space and here on earth