



Department of
 Health Services
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1
00:00:00,506 --> 00:00:02,546
[Background sounds]

2
00:00:03,046 --> 00:00:03,946
>> We have it just
in a tank of water.

3
00:00:04,066 --> 00:00:05,046
It's facing upward.

4
00:00:05,166 --> 00:00:09,036
This is a real human kidney
stone in this camera right here.

5
00:00:09,036 --> 00:00:11,846
And the idea being in the setup,

6
00:00:11,896 --> 00:00:15,706
first we can use our Doppler
ultrasound to locate the stone.

7
00:00:15,706 --> 00:00:16,416
>> So you can see it?

8
00:00:16,416 --> 00:00:19,256
>> Yeah, so it shows up
as twinkling pattern.

9
00:00:19,656 --> 00:00:22,196
And once you have
actually located the stone,

10
00:00:22,196 --> 00:00:25,696
we target on the stone
or just behind the stone.

11
00:00:25,696 --> 00:00:29,526
And then, you know, press a foot
pedal or press the button and --

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00:00:30,546 --> 00:00:32,496

>> Oh, you can see it moving.

13

00:00:32,716 --> 00:00:35,816

>> That stone will
actually go up.

14

00:00:35,816 --> 00:00:41,166

>> Because you're actually
moving the kidney stone inside

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00:00:41,456 --> 00:00:48,746

somebody's body without actually
having to do surgery on them.

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00:00:48,746 --> 00:00:49,976

>> Exactly.

17

00:00:50,376 --> 00:00:51,446

Completely noninvasive.

18

00:00:51,656 --> 00:00:52,426

>> That's amazing.

19

00:00:52,716 --> 00:00:58,476

So obviously you know we were
talking about, if an astronaut

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00:00:58,686 --> 00:01:02,786

or cosmoanaut had
this up in orbit,

21

00:01:03,376 --> 00:01:06,426

you can really start
a surgery up here.

22

00:01:06,466 --> 00:01:08,516

So you guys could use this --

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00:01:08,516 --> 00:01:09,226

>> Right. Exactly.

24

00:01:09,296 --> 00:01:10,846

You could basically
target the stone.

25

00:01:10,846 --> 00:01:17,296

Identify the path for it to
move out of where it's stuck

26

00:01:17,736 --> 00:01:21,236

into the ureters and
just push it right along

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00:01:21,276 --> 00:01:24,396

until it exits right
outside the kidney.

28

00:01:24,396 --> 00:01:26,136

>> And NASA's very
interested in it

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00:01:26,136 --> 00:01:28,906

because it's going
to survive in space.

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00:01:28,906 --> 00:01:30,796

It's a software based device.

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00:01:30,906 --> 00:01:32,716

So you can send upgrades
up to space

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00:01:32,856 --> 00:01:34,106

without flying new hardware.

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00:01:34,106 --> 00:01:36,166

>> You don't have
to swap it out.

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00:01:36,426 --> 00:01:36,536
Right.

35

00:01:36,536 --> 00:01:39,496
>> And then we have
these new capabilities.

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00:01:39,496 --> 00:01:41,936
It's not just a standard
[inaudible].

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00:01:41,986 --> 00:01:45,746
It's able to move stones.

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00:01:45,746 --> 00:01:45,966
>> Yeah.

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00:01:46,276 --> 00:01:48,636
>> Or other researchers
in this group are looking

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00:01:48,636 --> 00:01:50,836
at treating bone
loss with ultrasound.

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00:01:50,986 --> 00:01:54,056
So we could feed those in
maybe with a new probe,

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00:01:54,176 --> 00:01:58,496
maybe with a software upgrade
but you don't have to change

43

00:01:58,496 --> 00:02:01,586
that hardware that is
radiation [inaudible].

44

00:02:02,226 --> 00:02:10,846

>> Yeah, I think, you know, you
hit upon a point I think a lot

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00:02:10,846 --> 00:02:12,906

of people don't [inaudible].

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00:02:12,906 --> 00:02:17,656

You can't just fly a
normal piece of equipment

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00:02:18,416 --> 00:02:20,366

up to the space station.

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00:02:20,436 --> 00:02:24,216

That radiation is an
issue up there especially

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00:02:24,216 --> 00:02:26,286

if you start talking
about going to Mars.

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00:02:26,286 --> 00:02:28,536

So the equipment's got to be
built for that specific purpose

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00:02:28,536 --> 00:02:29,236

to [inaudible] that environment.

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00:02:29,236 --> 00:02:30,116

>> The ultrasound
that they've cloned

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00:02:30,146 --> 00:02:30,776

on station is in
[inaudible] orbit.

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00:02:30,806 --> 00:02:32,096

It doesn't see the same

radiation load that it would --

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00:02:32,126 --> 00:02:33,026

that a machine would
see once we leave

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00:02:33,056 --> 00:02:33,716

on a long duration mission.

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00:02:33,746 --> 00:02:35,186

>> You talk about just normal
things that happen to us here

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00:02:35,216 --> 00:02:36,386

on Earth, that, you know,
you get 6, seven months

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00:02:36,416 --> 00:02:37,406

out into space that
can be a big deal.

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00:02:37,436 --> 00:02:38,096

You know something that's kind

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00:02:38,126 --> 00:02:39,566

of a routine something you
could just go to the doctor for,

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00:02:39,596 --> 00:02:40,556

you know you don't
have a doctor up there.

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00:02:40,586 --> 00:02:40,736

You know.

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00:02:40,766 --> 00:02:41,126

>> Exactly right.

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00:02:41,156 --> 00:02:42,416

I think there is also an
earthbound application here

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00:02:42,446 --> 00:02:43,646

that most people that come
in have small stones --

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00:02:43,676 --> 00:02:43,743

>> Yeah.

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00:02:43,766 --> 00:02:45,296

>> And the doctors say drink
a ton of water and try to get

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00:02:45,326 --> 00:02:45,956

to those to pass naturally.

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00:02:45,986 --> 00:02:46,496

And they don't always.

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00:02:46,526 --> 00:02:48,056

And then they have to a surgery
that's got some complications.

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00:02:48,086 --> 00:02:49,076

So we would help those
small stones pass.

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00:02:49,106 --> 00:02:49,406

>> Come right in.

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00:02:49,436 --> 00:02:50,906

Maybe even same the patient
x-ray, CT to find the stone

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00:02:50,936 --> 00:02:51,956

because the urologist
could go ahead his

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00:02:51,986 --> 00:02:52,586
or her office can see it --

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00:02:52,616 --> 00:02:52,886
>> Can see it.

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00:02:52,916 --> 00:02:53,816
>> And they're not
so great at seeing it

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00:02:53,846 --> 00:02:55,166
on an ultrasound maybe right
now but if you could say,

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00:02:55,196 --> 00:02:55,736
I think that's a stone.

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00:02:55,766 --> 00:02:56,096
Let's nudge it.

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00:02:56,126 --> 00:02:56,876
Oh yeah it's a stone
it's moving.

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00:02:56,906 --> 00:02:56,973
>> Yeah.

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00:02:56,996 --> 00:02:57,986
>> And then not only
see it but encourage

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00:02:58,016 --> 00:02:58,796
that to leave right
there and then.

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00:02:58,826 --> 00:02:59,876
In fact they might be
in the doctor's office.

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00:02:59,906 --> 00:03:01,376
There could be some discomfort
in passing stones but you know

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00:03:01,406 --> 00:03:02,036
when it's going to happen.

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00:03:02,066 --> 00:03:03,356
So then the doctor could
already prepare the patient.

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00:03:03,386 --> 00:03:04,046
Give them some analgesics.

91
00:03:04,076 --> 00:03:05,516
Give a dilator that helps the
stone pass through the ureter

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00:03:05,546 --> 00:03:06,716
and it's all timed within
a very narrow window

93
00:03:06,746 --> 00:03:07,436
where they're in
supervised care.

94
00:03:07,466 --> 00:03:08,276
As opposed to this
could be weeks

95
00:03:08,306 --> 00:03:09,326
when they tell them
to go home and drink.

96
00:03:09,356 --> 00:03:10,886
And at some point it's going
to start to pass or it won't.