SonoMotion: A Budding Start-up Company

Ultrasonic Propulsion to Treat Kidney Stone Disease

Narrator:
A research team at the ***Center for Industrial and Medical Ultrasound*** has developed an ultrasound-based system to speed the passage of kidney stones. The system uses commercial ultrasound components to locate stones in kidneys. It creates clear pictures of them and then applies an acoustic radiative force, repositioning stones so they are more likely to pass naturally from the kidney. A start-up company, ***SonoMotion***, has been founded in an effort to bring this ultrasound therapy to clinics and hospitals around the world.

Mike Bailey:
As a research group, we're focused on getting to the point of a clinical trial and demonstrating that this works in people. And our solution is to use basically an ultrasound machine. Put one probe, put it on the skin, find the kidney, see it on the image, push a button over here to turn on the ability to focus the ultrasound, and then push that stone.

We took that system down to the American Urological Association annual meeting and we let anybody in the expo come by and try it out. In particular, we were also invited to the Stone Society – urologists who specialize in treating kidney stones – to give our presentation. They received it so well that they all kind of went *en masse* to our exhibit and tried out the system, with extremely favorable results.

Ryan Hsi:
My name is Ryan Hsi. I'm one of the urology residents working with Dr. Bailey over the last six months. One of the things that has been really pushed by our national organization – the American Urological Association – is the use of hands-on ultrasound by urologists.

Urologists will have to learn how to use the device and learn how to image the kidney stone and how to push it with the device. We've developed a number of models – from stones in a water bath that demonstrate the stone being pushed away from the device to phantoms that you could push through a maze to more realistic models that involve a human torso with a kidney that's realistic under the ultrasound.

Bailey:
This year, they invited us back to give a plenary talk. This is called a "state-of-the-art" session. And the urologists I've talked to say this is unprecedented because we're still a laboratory experiment in their eyes. We have not been used in people yet. It's not really state-of-the-art because it's still research. I think they're excited to see this coming – they want to try it.

Mathew Sorensen:
It's common for there to be leftover pieces, fragments, dust, or gravel after we do a treatment for a stone. Sometimes those clear on their own. Often they don't. They can grow to bigger stones that require additional treatments. One of the arguments in favor of this therapy is that it is non-invasive and we suspect it won't have much discomfort and it will alllow us to clear out some of those fragments that tend to be left over.

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Bailey:
At this point, we've really demonstrated we can expel the small stones out of the kidney that tend to be trapped that account for one-third of the lithotripsies that are done. These are shock-wave treatments – surgeries on stones. That's over a hundred thousand treatments in the U.S. each year that we would save. These get reimbursed at five to ten thousand dollars from insurance – health costs to health care. That's five-hundred million to one billion dollars in savings right there if we could just expel these and save those people from doing the treatment.

We have a whole team of about twenty five, which includes engineers to build this whole system, and acoustics experts to measure the outputs to make sure we're at safety level. Students have been a large part of all those processes. Then we have urologists as well as urology residents who are training to be urologists as part of our team directing how it's used clinically and then writing publications, presenting to their community speaking the language that they hear.

We've worked very closely with C4C (UW Center for Commercialization) throughout. One of the aspects that C4C takes care of is patenting the invention disclosures that we create and guiding us in how to explain what we've done and how that's patentable. We've submitted – they have submitted on our behalf – one application for a patent in the United States and then they submitted that same patent in Europe and Japan to continue to protect the main idea of repositioning kidney stones.

Then, we have to plan going forward to start an ultrasound company that builds a product like this. At this point, we've partnered with the hardware manufacturer who is based in Washington – the state of Washington. But ultimately, we believe there would be a Washington-based company supplied by Washington State components that sends this hardware to us in a very finished form. Our company – ***SonoMotion*** – adds the software to move stones and does the final testing for that component, and then ships these off all around the world to treat stones. This is a worldwide disease that affects five to fifteen percent of the population of the world.

This is APL The Applied Physics Laboratory at the University of Washington in Seattle.