We're particularly excited about the most recent publication-- it just came out in September of 2018.

In that study, we had 156 individuals that had been dependent on either alcohol, or cocaine, or nicotine.

And we looked at the areas of the brain that were active when they were looking at drug cues.

What we found was that even though we often think about those diseases as being different diseases, there's something common about all of them.

And that's the activity in this brain region called the medial prefrontal cortex. Transcranial magnetic stimulation is a non-invasive form of brain stimulation, which actually uses magnetism to cause changes in the brain.

I know that sounds a little weird, but the brain is an electrically sensitive organ.

And if we have a magnetic field and we turn it on and off really quickly, you get to see a change in the brain activity.

It'll actually fire neurons. The current target for depression is an area called the dorsal lateral prefrontal cortex, but a lot of people that are doing great basic science research in the laboratory have shown in animal models of substance use, you can actually shine light into a very specific portion of the brain, which is similar to our medial prefrontal cortex area-- which is highlighted in this paper.

And when you shine certain frequencies of light onto that brain region, you can stop an animal from taking a drug.

If you shine a slightly different frequency of light into that same brain region, you can cause an animal to self-administer a drug.

So that same brain region that's present in the animals is actually also, the brain region that we see in this most recent study in translational psychiatry.

So what that means for us is that maybe with a non-invasive treatment-- like transcranial magnetic stimulation-- we can increase or decrease activity in this brain region.

And cause individuals to stop being sensitive to cues. Right now, I'm happy to say that we have a few phase two clinical trials going on at MUSC, where we're evaluating transcranial magnetic stimulation over the medial prefrontal cortex, as a tool to help people that are already engaged in rehab. The future is really exciting.

Most of us are used to taking drugs when we have ailments.

So we go to a doctor and the doctor will prescribe a few pills and then we go get it filled at the pharmacy.

But we know that the brain is not just a bunch of chemicals with no structure.

The brain has certain circuits in it.

And there's now, more and more every day, strong research and more and more FDA-approved indications for brain stimulation treatments.

So not taking drugs anymore, but actually targeting our therapy towards the specific neural circuit that might need a little help in order to bring people back to a baseline.