

Innovative tubing improves mobility for Team Gleason House patients

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From the moment they walked into the Team Gleason House for Innovative Living in August 2016, Tulane biomedical engineering seniors Justin Baris, Joy Jason, Allen Zhang and Katherine Brocker had one goal—to take their three years of study and create a Senior Team Design project that would help residents.

So before the fall semester even started, they spent two weeks at the Gleason House, based at St. Margaret's Daughter's Home in Mid-City, working directly with ALS patients as they struggled with the kind of everyday tasks that most people take for granted.

Their objective? To gain a deep understanding of these challenges, brainstorm innovative technological solutions and ultimately design a product that would improve patients' quality of life. That meant meeting with doctors and therapists, accompanying patients on clinic visits and observing them as they performed basic functions like eating and getting in and out of bed.

Nine months later, their product—dubbed the SmartCoil—is in the patent-pending stage, and they are hopeful that it will eventually go to market.

SmartCoil is a cartridge-based oxygen tubing system that allows patients on long-term oxygen therapy to control the length of the tubing. Design features include manual dispensing and automated retraction of oxygen tubing, easy access to the cord and a safety mechanism to prevent the tubing from kinking.

"We saw how the patients used their oxygen and we really got to experience the problems they had firsthand," said Jason. The students quickly noticed that as residents moved around in their wheelchairs, the oxygen tubing dragged along behind them, decreasing their mobility and presenting a tripping hazard.

During the 2016–17 academic year, the students met regularly with their adviser, bioinnovation program manager Anne-Marie Job, to brainstorm ideas for improving patients' daily lives. Using their background in mechanics, electronics, circuits and patient-driven design, along with computer-aided design, physics and economics, they narrowed down a long list of ideas to develop SmartCoil. They made a prototype using various materials, tools and machinery, including 3-D printers, in Tulane's MakerSpace.

"I think in general we're all happy with how it turned out," Baris said. "I had no idea what to expect coming into this. But it was awesome not only to discover a problem but now we have a provisional patent on a real product that we're proud of. It was a cool experience."

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