

# CASE STUDY

Marianjoy Rehabilitation Hospital



## Behind the Marianjoy Miracle

Rehabilitation professionals who strive to control costs and improve care face a Catch-22. They look to new procedures and technologies to provide more efficient, cost-effective care. But new methods, by definition, have unproven track records. So how do new technologies demonstrate valuable, cost-effective clinical outcomes when providers understandably want evidence of their effectiveness first?

Enter Marianjoy Rehabilitation Hospital in Wheaton, Ill. Through its 170,000-squarefoot main hospital and multiple clinics and outpatient therapy centers, Marianjoy provides unique inpatient and outpatient offerings to treat stroke, spinal cord injury, brain injury, pediatrics, and orthopedic/musculoskeletal conditions.

But the soul of Marianjoy is its commitment to what Susan Brady calls "evidence-based practice," the constant building of clinical expertise through the integration of available external evidence.

"Marianjoy is a learning organization," said Brady, Director of Research and Outcomes for Marianjoy. "We're always trying to produce new knowledge. We're not consumers of the new evidence out there. We're actually producing it through our research, looking at our clinical protocols and looking at our outcomes in a systematic fashion."

A current example of Marianjoy's ongoing efforts to produce that vital knowledge is its early adoption of Ekso GT™, a wearable bionic suit that enables patients with lower extremity weakness to stand up and walk over ground with a natural, full weight bearing, reciprocal gait. In April, Ekso GT became the first robotic exoskeleton to be granted clearance from the U.S. Food and Drug Administration to market to rehabilitation patients with stroke and higher spinal cord injuries.

Based on insurance claims data, there are 680,000 stroke and SCI patients undergoing 5.9 million rehab sessions each year at 16,000 U.S. facilities.

Marianjoy therapists have been working with Ekso's ground-breaking device since 2015. After initial training and trials produced encouraging results, the staff is determined to expand usage of Ekso, in hopes not only of improving patient outcomes but creating clinical evidence that indicates how to use the device for optimal effect.

"You always have to be skeptical," said Dr. Jeffrey Oken,

**"One of the challenges I faced before working with Ekso was getting my patients' step count up. There's a lot of research that says the more steps you take, the better your recovery. But if they're having a hard time just achieving upright posture, it's hard for them even to take a couple of steps without it being completely exhausting on the patient and the therapist. Compared to traditional therapy, they definitely are taking more steps with the Ekso exoskeleton."**

Cassandra Anderson  
Physical Therapist at Marianjoy

Marianjoy's chief medical officer. "I've been practicing here at Marianjoy for 25 years, and you see a lot of devices. People say, 'This is going to be it.' But Ekso is different. As I've learned more about what the equipment does, we've been able to see what other uses there are for them."

The commitment to the new technology already has taken Marianjoy clinicians in unexpected directions, with immediate, positive impact on patients.

"There was this young girl in her 20s," Oken said. "She was walking around with a walker. And they put her into Ekso for a training session. She trained for about 20 or 30 minutes. She got up and walked so much better after just one training session with the Ekso."

"I was thinking Ekso was for somebody with severe paralysis. This was somebody who was actually doing pretty well, who got improvement in her gait pattern and improvement in her walking ability and speed just from one session. It's amazing. If we hadn't been doing training, she may never have been in the device."

As Oken said, it's appropriate for care providers to approach new technology with a healthy dose of skepticism. But Brady

believes there are three other barriers to early adoption:

- Motor learning – simply learning how to use the new equipment. Sometimes the necessary training can be extensive.
- The cognitive component of learning a new task what Brady calls “that mental blueprint in your head” – the step-by-step method to completing each task.
- The affect of the learning domain.

The last barrier, which Brady believes is the most significant, isn't about the nuts and bolts of learning something new. “The affect of the learning domain refers to your perceptions and attitudes about a new product or a new technology,” she said.

“If I'm somebody who is resistant to get my toes wet to learn about new technology that's something that needs to be addressed,” Brady said. “I think a lot of companies don't take that into account. I think they go straight for the motor and cognitive learning. They forget that you have to convince people that this is a good product.”

Marianjoy has launched a project with its physical therapists to look at how they adapt to new technology, using Ekso as one of the key examples.

“When I hear there's resistance to a new technology because there's not enough available evidence out there, my response is Marianjoy is a leader in the industry,” Brady said. “We should be pioneers who are helping to create this new evidence. I feel we have a responsibility to help, to be that pioneer to pave the way for that new evidence in order to identify the best protocols and clinical pathways to optimize the clinical outcomes for the patients we serve.”

Nick, a recent stroke patient, described his experience when Marianjoy added Ekso to his rehabilitation. “I didn't know what to expect,” Nick said. “I was walking, but nothing like this. I started crying, because I knew then I could do it.”

Like Nick, “A lot of patients I put in Ekso are patients who have had a stroke,” said Cassandra Anderson, a physical therapist at Marianjoy. “Before the Ekso, some patients would struggle with the initiation of gait the entire rehab stay. And sometimes, they would even leave here not walking, because they were unable to initiate.

“Patient engagement is critical,” Anderson continued. “A patient has to know why they're doing something. They have to believe in what they're doing to be successful. Once they're in it, participation is sort of contagious. Someone sees their co-patient in it. Patients start asking, ‘Hey, when can I do that?’”

Brady said, “We seem to see all the unique cases here, the one in a million – they seem to come to Marianjoy. We want to systematically study what was so unique about this case and what was so unique about the treatment we provided that produced what we call the Marianjoy Miracle.”

For the Marianjoy Miracle to be available to a significant

number of patients, its leadership also has to look at cost effectiveness, Dr. Oken said.

“The value we bring to rehabilitation is we improve people's functional abilities; we improve their quality of life,” he said. “We also have to show value to the payors. If we can show that by putting somebody in Ekso, that can expedite the recovery, getting them to a certain point quicker, then it's worthwhile to spend those resources early on to get somebody home quicker.

“We've been in our what I'd call ‘traditional model’ of how we deliver therapy services. But I think we're at the cusp of that changing. Because now we have options that will help patients improve quicker, that will give them more ability to achieve those goals that may not have been achievable.”

As with any emerging technology, there are many questions still to answer with the Ekso, Oken said.

“What is the correct dosage? We don't know at this point in time how much we should give them – once a week, twice a week, three times a week, every day. Should it be an hour, half an hour, two hours? In these robotic devices like Ekso, there isn't literature out there that guides us in this,” Oken said.

“So we're developing protocols that are going to help us be better able to treat the patient and try to gauge what is the appropriate amount of treatment,” he said. “When should we start it? Should we start on day one, day three, day five? Nobody knows the answers to these questions. Every stroke is not the same; every brain injury is not the same; every spinal cord injury is not the same. Applying innovation on an individual basis is important.”

Anderson added, “One of the challenges I faced before working with Ekso was getting my patients' step count up. There's a lot of research that says the more steps you take, the better your recovery. But if they're having a hard time just achieving upright posture, it's hard for them even to take a couple of steps without it being completely exhausting on the patient and the therapist. Compared to traditional therapy, they definitely are taking more steps with the Ekso exoskeleton.

“I think there are a lot of pros, working with Ekso. Once patients get in the upright posture, it just gets them the confidence they don't have until they say, ‘I stood for the first time after having a stroke.’”

Examples like these are why Oken promotes the idea of rehabilitation through innovation throughout Marianjoy. “What this means is that we are trying to push the rehabilitation envelope through innovation technology and innovative ideas.”

In Ekso, Oken believes Marianjoy has found an excellent partner. He said, “Ekso is going to make us a leader in technology innovation.”

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