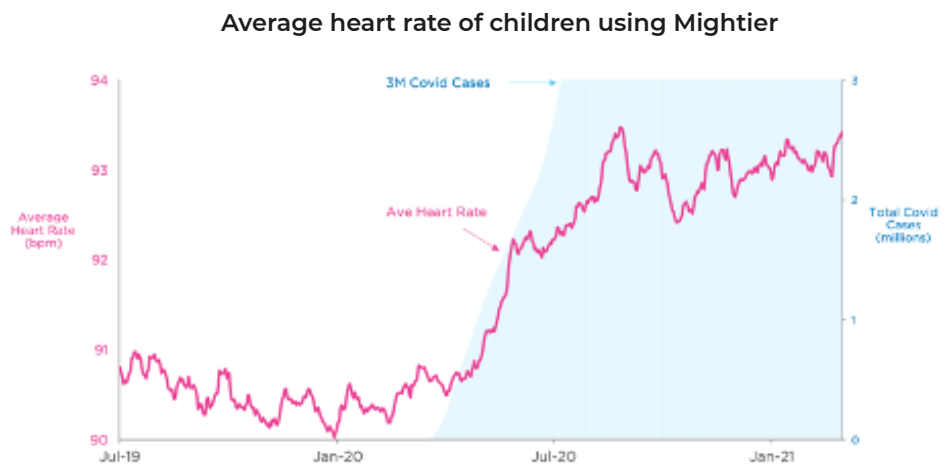


# Supporting treatment of children with autism with Mightier video games leads to **45% improvement in symptoms**

The COVID-19 pandemic represents a shared social stressor of a magnitude that has not been seen in generations. This has led to both increased behavioral challenges for children, especially those with Autism Spectrum Disorders (ASD), in tandem with a reduction in availability of services from prolonged closures. In this climate, new services and tools are necessary. Magellan Healthcare partnered with Mightier to distribute and evaluate a clinically proven biofeedback video game program to children receiving Applied Behavioral Analysis (ABA). In this pilot, children showed improvement in both clinical symptoms and quality of care metrics, with parents reporting a less stressful and more supportive environment. These data illustrate both an important step forward in the care of children with autism and promising new directions in the delivery of care as the behavioral health needs of all children grows post-pandemic.

## The Pandemic has changed the landscape of pediatric mental health.

The pandemic has increased children's heart rates, a biological fingerprint of the increased stress.



The global COVID-19 pandemic has created overwhelming stress for all children. Children's own bodies have told the story, with heart rates rising in tandem with the case counts of the global pandemic. The structures that help children thrive, from school to therapy, disappeared and changed drastically. Post-pandemic, even more children need extra support. Children with Autism Spectrum Disorders (ASD) rely on these services more than most. Children can receive Applied Behavioral Analysis (ABA) services multiple days per week, psychopharmacology services, psychotherapy services, and in-school services. The pandemic put increased pressure on caretakers, providers, and payors to adopt novel tools and programs.

## Tools and settings can make a difference in this new climate.

New and innovative approaches are required to reach families, both in the pandemic and as families transition to new post-pandemic needs. The most successful tools will reach families in their homes, and use technology to provide new experiences that can augment traditional services in ways that were not previously possible.

Mightier is a proven in-home program that helps children build emotional regulation skills. Children play video games while wearing a heart rate monitor, and learn to apply skills like deep breathing. Mightier progress can be quantified through the high number of moments of practice that children experience: times when they have an elevated heart rate and are able to bring their heart rate down. Previous research at Boston Children's Hospital and Harvard Medical School demonstrated the clinical impact of Mightier. Mightier is immediate and scalable, meaning families get help right in the moment of need, and avoid the wait associated with starting new services.



## The Magellan Healthcare pilot with Mightier.

Mightier integrates with Magellan's focus to address pediatric behavioral health through proactive interventions, combined with holistic clinical management and digital therapeutics to deliver positive behavioral health outcomes in children. Magellan provided members access to the Mightier program for a period of twelve weeks during the COVID-19 pandemic. Thirty-six families were recruited and randomized into a group that received Mightier in addition to ABA, or a group that received only ABA as a control, and this preliminary analysis includes the data from 25 participants. Fifteen are in the Mightier group and 10 are in the control group.

## The impact of a Mightier deployment.

### Children engage with Mightier at a high rate

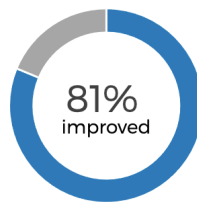
Mightier families played for an average of 60.4 minutes a week, above the recommended 30 minutes per week recommended to see clinical change. The finding is two-fold. First, families receive an appropriate dose for improvement. Second, the weekly commitment from families is relatively small in order to see meaningful change. Over the twelve weeks, children experienced an average of 570 moments of practice, showing that children were engaging with the core learning mechanism within Mightier. These results exemplify how Mightier can continue to drive high engagement as an alternative evidenced-based tool provided by healthcare insurers.

### Clinical symptoms improve

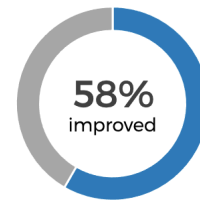
Eighty one percent of Mightier families report improvement on their primary symptom, compared to 58% in the control group. Overall, participants report 45% better symptomatic gains compared to a control group. Notably, children show twice as much reduction in aggressive symptoms. This demonstrates that the learnings from Mightier transfer to families' lives, leading to meaningful gains beyond the games.

Families report more progress on primary symptoms when adding Mightier to their treatment.

**MIGHTIER**



**CONTROL**

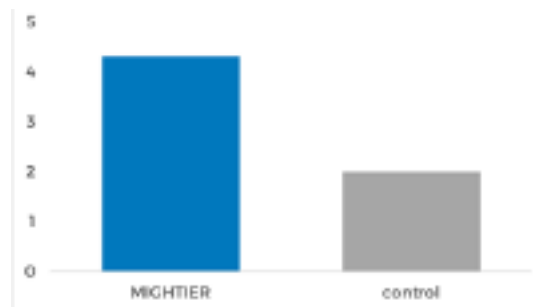


*Eighty one percent of families using Mightier reported progress on their primary symptom, compared to 58% receiving only ABA.*

### Children show twice as much decrease in aggressive behaviors.

Families who report a concern with their child's aggressive behaviors report twice as much symptomatic improvement compared with families receiving only ABA.

**CHANGE IN AGGRESSIVE BEHAVIORS**



## Families report a less stressful and more supportive environment

When deploying an intervention, it is important to understand families as a whole, and not only look at children's symptoms. Families using Mightier also report a decrease in stress, an increase in confidence, and an increase in access to resources relative to control. These gains point to not just child improvement, but parents and families able to function at a higher level.

Mightier increases measures of family functioning. Stress decreased, confidence increased, and access to resources increased relative to controls.

MEASURE	IMPROVEMENT RELATIVE TO CONTROL
<b>Family stress</b>	<b>88%</b>
<b>Parent confidence</b>	<b>75%</b>
<b>Parent access to resources</b>	<b>50%</b>

## A family's story using Mightier.

Matt\*, a 10 year old boy diagnosed with Autism Spectrum Disorder, received ABA therapy for several years to help manage his difficulty with physical aggression towards himself and others, low frustration tolerance, and difficulty self-regulating.

Matt began playing Mightier during the COVID-19 pandemic as an additional support to his therapy. Matt was excited to engage with Mightier, as he loves video games. While playing Mightier, Matt practiced coping skills routinely and began to understand the connection between his heart rate and his emotions.



***He was extremely aggressive almost every day...  
Now he will only have those incidents happen once a week or so and they are much less severe.***

**-MATT'S MOM**

Within two months, Matt began using language from Mightier to express his emotions, which allowed for more productive and positive conversations. After he had played for 3 months, Matt's mother and therapists reported major improvements in his behavior. Matt's mother shared, "He was extremely aggressive almost every day. ... Now he will only have those incidents happen once a week or so and they are much less severe."

*\*Child's name changed for privacy*



A calming exercise from Mightier games

## Findings help payors provide enhanced services for low cost.

Payors invest a tremendous amount in ABA, with recent estimates that a single family receives over \$40,000 in services over a single year. These findings suggest that low-cost intervention, totaling less than 1% of the existing ABA expenditure, can improve clinical outcomes by at least 45% and double family confidence. The same cost increases the parent-reported response-rate to intervention by 60%. The ability to make such a large impact at an ultimately negligible cost changes thinking about care. Every child receiving any amount of ABA care should additionally receive Mightier, given the potential to increase the impact of existing services.