Can Videogames Treat ADHD?

Start-Ups Seek FDA Approval for Games That Help Attention Disorders

By Brian Gormley

If two start-ups have their way, videogames might cure more than just boredom. They could also be used to treat attention-deficit hyperactivity disorder.

Akill Interactive Labs Inc. of Boston, formed by start-up-creating firms PureTech Ventures, and San Francisco company Brain Plasticity Inc. are seeking Food and Drug Administration approval for a videogame treatment they hope clinicians will turn to before prescribing medicines for ADHD.

The disorder, whose symptoms include difficulty paying attention and remaining focused, affects 9% of adolescents and 4.1% of adults in the U.S., according to the American Psychiatric Association.

The companies are building on research suggesting that action videogames can sharpen players' ability to concentrate, and may have other medical or health benefits. University of Toronto scientists said in April that action videogame play causes improvement in "visual attention," which is needed to drive a car or track changes on a computer display.

In 2010, University of Rochester and University of Minnesota researchers found that action videogames can train people to make the right decisions faster. If proven effective, doctor-prescribed videogames could treat a medical illnesses without exposing patients to the side effects seen with today's medications, including stimulant Ritil, made by Novartis AG. Psychotherapy and medication can reduce ADHD symptoms, though side effects of stimulants, the most widely used medicines, can include decreased appetite, sleep problems, anxiety and irritability, according to the National Institute of Mental Health.

These companies face an uphill battle. The FDA has never approved a videogame as a medical therapy. And despite the side effects, today's ADHD medicines generally are well tolerated and effective, said Lenard A. Adler, professor of psychiatry and child and adolescent psychiatry at NYU Langone Medical Center.

"When we look for other therapies, we want to be sure they will work as well as the accepted therapies that we have," Dr. Adler said.

Akill co-founder Eddie Marucci said his company's research shows that people who play new games are better off than today's power medicines. "We would aim to have efficacy and tolerability that outstrips any of the drugs," said Dr. Marucci, an associate at PureTech Ventures.

Dr. Marucci is part of a team of PureTech entrepreneurs that forms start-ups with new approaches to medical and research problems. About two years ago, they began looking for ways to test neurological disease without using drugs or invasive procedures. This led them to the field of videogame research, where scientists were finding correlations between videogame skill and cognitive functions.

The PureTech team was especially drawn to the work of Daphne Bavelier of the University of Rochester and Adam Gazgaley of the University of California, San Francisco, who were studying how the brain processes information that is relevant to a task and blocks out distractions.

Dr. Bavelier had found that players of fast-paced action videogames outperform non-gamers in their visual attention skills, or the ability to concentrate visually on an object while ignoring irrelevant information. Visual attention is important for things like driving or picking a friend's face out of a crowd.

With research increasingly suggesting that neurological benefits are a byproduct of recreational, action-game play, PureTech teamed up with Dr. Bavelier and Dr. Gazgaley to design videogames that stimulate parts of the brain in ways that could be medically useful. With Dr. Bavelier's and Dr. Gazgaley's guidance, and advice from videogame experts like Noah Falstein, formerly of videogame publisher LucasArts Entertainment Co., PureTech launched Akill in December.

Akill—which means "wisdom" in Swahili—hasn't disclosed how its game designed for smartphones and tablets is played, but Dr. Gazgaley said it is designed to affect the prefrontal cortex—an area involved in goal-directed behavior—and visual and motor parts of the brain to strengthen the ability to concentrate and ignore distractions. Akill has a neural imaging study underway with its current game in healthy individuals and its clinical trials will begin shortly.

Meanwhile, Brain Plasticity has launched clinical tests of computer-based exercises to treat schizophrenia and ADHD, said Henry Mahanick, chief operating officer of Brain Plasticity and chief executive of San Francisco-based PhD Science Corp.

Brain Plasticity was spun off from Posit, which built a profitable business selling software to improve the brain's ability to process and remember information it takes in through sound. Like Akill's game, Posit's flagship, Brain Fitness Program—which uses games to improve the ability to hear and recall speech—works through the principle of neuroplasticity, or the brain's ability to rewire itself in response to learning or new experiences.

Brain Plasticity, which pursues the medical potential of Posit's research, is testing its "ADHD suite," a set of 25 exercises designed to train the cognitive skills of alertness, attention, working memory, impulse control and suppression of distractions, according to Dr. Mahanick.