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FlexPro Grip Could Turn Pitchers Into Iron Man—Or At Least Protect Against Tommy John Surgery

By Joe Lemire
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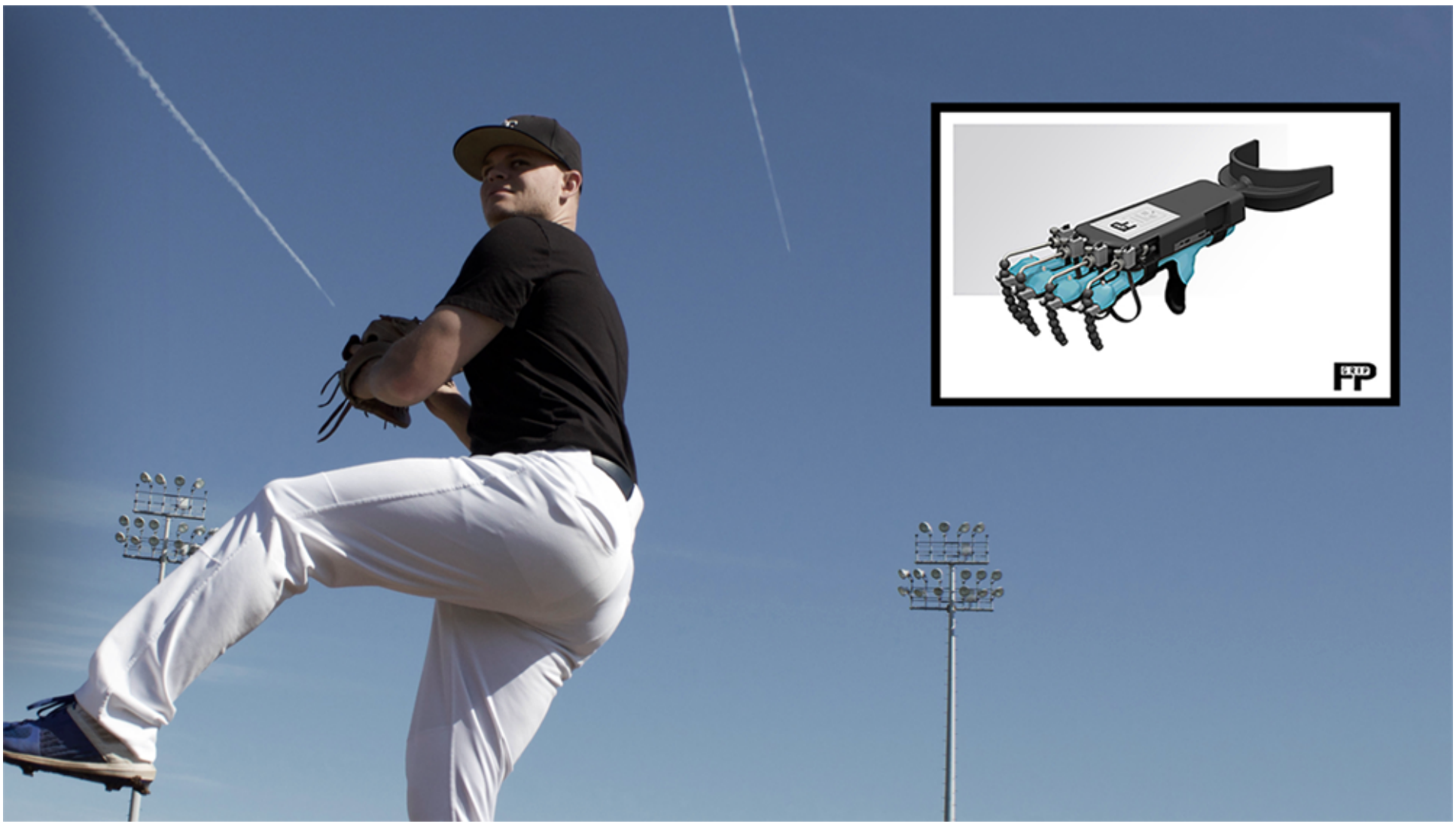
Daryl Moreau, the CEO of FlexPro Grip, namechecks a series of movies to describe the evolution of his company's patent-pending tool that seeks to strengthen finger and forearm muscles in a way that could help pitchers avoid Tommy John surgery, add velocity, and improve the spin rate of their pitches.

"I call this going from Robocop to Edward Scissorhands into something that looks more Iron Man-like," Moreau says, holding up the exoskeleton-looking training device that is currently in limited release and will enter a formal beta program this summer (with designs on going to market early in 2022).

Daryl, along with his son and business partner Adam, built the device after conducting a meta-analysis of research related to the forearm, hand, and elbow that identified the three muscles—the flexor digitorum superficialis (FDS), flexor carpi ulnaris (FCU) and flexor digitorum profundus (FDP)—that act like a protective sheath around the ulnar collateral ligament, helping offload torque. UCL tears are the ones that require the Tommy John procedure.

“Everybody recognizes those three muscles as being extremely important in terms of protecting the UCL,” says Dr. Gunnar Brolinson, a Virginia Tech sports medicine physician and medical advisor to FlexPro Grip. “The problem has been how to specifically isolate and train those muscles. And there has not been a device to date that’s been able to do that.”



Even in Major League Baseball, squeezing tennis balls and burrowing one’s hand deep into rice buckets are common methods of strengthening the forearm and hand. FlexPro Grip offers a higher-tech alternative, with data-driven feedback on the amount of force generated by each finger and the rate at which it is generated. The company recently conducted its own analysis through needle electromyography; it showed that various applications of force with the device successfully targeted the FDS, FCU and FDP muscles individually.

“The missing link has been the ability to specifically strengthen that last link in the kinetic chain, which is the forearm and hand, essentially, that is the terminal release of the baseball,” Brolinson says. “So you’re externally rotating and cocking the arm, that places a lot of stress across the medial—the inside—part of the elbow, and as you begin to then accelerate and release the baseball, there really hasn’t been a way to specifically strengthen those muscles that—based on the literature—would suggest that you can protect the UCL.”

Australia national baseball team performance coach Gary McCoy, who engineered an injury-free baseball season in Taiwan, has spoken with the Moreaus a few times over video calls and says that if he were working for an MLB organization, he would introduce FlexPro Grip to his team “without question.” Based on the studies he has reviewed, McCoy says there are preliminary indications that the forearm muscles this device trains would provide a scaffolding effect to support the UCL, both as a preventative measure and in rehabilitation. (Relatedly, these muscles’ role in throwing is why forearm tightness or pain is often a harbinger of a UCL tear.)

When spin rate became the spotlighted pitching metric a couple years ago, a coaching friend contacted McCoy and confessed, “I don’t know how to develop it.” Because FlexPro Grip provides objective feedback on a pitcher’s development of finger strength, McCoy recently reported back to his friend, “Finally, something that can translate to spin rate.”

MLB pitchers are elite and well established in their mechanics, McCoy notes, so making significant changes at the big league level is challenging. There is fertile ground for improvement, however, with pitch repertoire and effectiveness. “What pitch arsenal should we then recommend based upon what the [assessment] looks like?” he says. “And maybe they'll see something like, ‘He really has incredible strength in his middle finger, and therefore that matches up with this pitch and with that pitch.’

“I think, firstly, finger grip and grip analysis has been missing. It's been a massive blind spot. Their assessment process through this is going to open up a lot more questions, which is a really good thing, than we have current answers.”

A few recent studies conducted by ASMI’s Glenn Fleisig and a consortium of researchers in Japan have begun quantifying the timing and force of fingertip pressure on the baseball while pitching. For example, they determined that peak finger force occurs at both 39 and again at 7 milliseconds prior to pitch release. The middle and index fingers produce up to 25 pounds of force to throw 85 mph and up to 34 for a 100-mph pitch. Some of the finger joints move at up to 8,000 degrees per second through ball release, with an impact on velocity and command.

FlexPro Grip can show each finger’s contribution to the overall flexion force, and early assessments with a pair of minor league pitchers have shown expected correlations. The pitcher who relies primarily on a two-seam fastball, or sinker, produces almost double the force with his index finger as his middle finger. The pitcher with the high-spin-rate four-seam fastball produces roughly equal amounts of force with those two fingers. Someone with a good cut fastball, or cutter, which moves in the opposite direction of the sinker, would create a higher proportion of force with his middle finger.

“Rather than just training for equivalence, you can train to further increase the separation of those two numbers to then create a two-seam or a cutter that truly no one on Earth has ever seen before,” Adam Moreau says.

When a shoulder surgery derailed Adam Moreau’s pro ball aspirations, he and his father started the New Orleans Sports Performance Institute in 2016, with an emphasis on training baseball players. Self-described “sports science nerds,” the two pored through studies to find new training methods.

One under-explored avenue highlighted in a 2017 paper related to grip strength, which had an unusually high correlation to both pitchers’ throwing velocity and hitters’ exit velocity. The Moreaus saw some early results having their players use a Jamar hand dynamometer. Around the same time—early 2018—they traveled to Blacksburg, Va., to see Brolinson, who had been treating Adam and his shoulder for years. (Daryl Moreau has worked in healthcare management for nearly 30 years and was formerly CEO of a cardiology group based in Toledo, where he first met Brolinson, who later moved to Virginia Tech.)

At the time, one of Brolinson’s colleagues had developed his own crude grip training device. The Moreaus studied that prototype and dove into the elbow injury literature, asking about UCLs: why and how they tore, who tore them, and where on the ligament did they usually tear? They went down rabbit holes from one paper to the next, from footnote to another.

“Both in terms of my own life—and I think the way I've even raised my kids—my issue is always just ask why,” says Daryl Moreau, a former Tulane basketball player who still holds the national high school record for most consecutive free throws, with 126 from Jan. 1978 to Jan. 1979 while at New Orleans’ De La Salle High. “Just ask why. And you’re going to conclude after a while that, if you ask why enough, you're either going to figure out the answer, or you're going to find out the people you're talking to don't know what the hell they're talking about, so you just move on to someone else.”

FlexPro Grip is starting with baseball, but the device may prove useful for more than just elite athletes. “We’re talking today just about a baseball application,” Daryl Moreau says, “but we've had people physicians already tell us that this will have far greater application in the physical therapy/occupational therapy market for anybody who does any form of hand surgery.”

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