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CASE STUDY

Case Study: KINVENT Brings Pro Level Training & Preventive Injury Care to All

A South Carolina-based sports physical therapist uses KINVENT K-Deltas Force Plates to elevate the level of therapeutic care he delivers to non-professional athletes – in less than an hour per session

When Dr. Nate Harris worked as a staff physical therapist for the Pittsburgh Pirates and Seattle Seahawks, there were few training and rehabilitative tools he couldn't get his hands on. The teams' deep pockets meant therapists could splash out any equipment that could be dreamt up – from anti-gravity treadmills to Bluetooth-enabled compression shorts that measure muscle activation.

In short, professional athletes and their trainers have access to "the best of the best," according to Harris.

It came as no surprise to him: professional sports teams – and some illustrious college teams – know their athletes are their greatest investments, so they are *treated* like investments. What did surprise Harris, though, was how radically different the level of treatment *non-professional athletes* typically receive is.

When compared to the almost futuristic care professionals receive, the therapy available to non-professional athletes has a dark ages quality to it. Testing tools are largely analog – not digital. Data can be qualitative – not quantitative. And the focus of care is generally reactive – not preventative.

Harris wanted address those inequities. So, when he founded his practice, Velocity Sports Physical Therapy, in early 2021, he was determined to bridge the care gap that exists between amateurs and pros. To do that, he knew he would need to approach his practice from a different angle than other therapists – and invest in equipment closer to what professional athletes use.

Providing Preventative, Whole-Body Care

In professional athletics, preventative care is a standard practice: it's far easier to guard against injury by monitoring performance and focusing on strengthening and conditioning than it is to rehabilitate a torn ACL or reconstructed shoulder. It's a principal Harris wanted to apply to his practice.

> *I want to give local high school and college athletes the same quality of care as pro athletes.* - Dr. Nate Harris

So, instead of myopically focusing on rehabilitation – the norm in sports physical therapy – Harris also helps his patients *prevent* injuries. Those patients come from a diverse range of athletic backgrounds: some are college and high school athletes, some play club sports, and others are highly active individuals like CrossFit and Orangetheory trainers, and recreational golfers.

And, while Harris and his team work with athletes from all sports, they specialize in upper-body intensive sports – like baseball, volleyball, golf, swimming, and lacrosse – which is a rarity in the field, according to Harris.

Because of his unique specialization, Harris treats many patients with UCL, wrist, forearm, and neck pain, and rehabilitates patients recovering from Tommy John, rotator cuff and labrum surgeries.

His goal, though, is to help patients avoid getting to the point of pain and surgery *altogether*. To help non-injured athletes remain healthy throughout the season, Harris runs individualized movement assessments that check for deficiencies that could predispose them to injury.

While specific tests vary based on the patient and the activity they participate in, Harris generally checks the subject's shoulder and hip range of motion and their ability to dissociate their lower and upper body. If Harris notices any red flags (poor external rotation, for example), he transitions the athlete to a strength and conditioning plan, to ensure they prepare their body to play their sport as safely as possible.

In addition to treating patients in his clinic, Harris travels to schools and clubs to test entire teams. Before a season begins, Harris will assess players to establish their baseline values – which he keeps as a point of comparison if athletes do get injured. Sometimes, Harris will return to test the team throughout the season to monitor for red flags.

An Effective – But Time Consuming – Approach

A year ago, Harris tested a team of 16 high school baseball players to establish their baseline strength values. He used analog methods to run through three tests with each player; completing the assessments took him 2.5 hours.

While the data Harris collected was valuable, the time it took him to obtain it hindered his ability to deliver pro sports-level care to as many athletes as he would have liked.

Setting up simple, routine tests was a slog. For example, it took approximately 10 minutes to prepare an individual jump test – a fixture of Harris' assessments. And, in addition to being slow, the numbers Harris got from the tests, which involve cameras and shutter speed, were "not exactly the most accurate."

Harris knew he was on the path to shrinking the care gap – his approach hit the mark. That meant it was time to bring the second half of the equation into play: innovative, digital equipment.

More Preventative Testing, Faster

During his stints working with professional athletes, Harris was exposed to a dizzying number of highly specialized, high-tech tools. But Harris wasn't looking to amass an assortment of niche equipment. Instead, he was on the hunt for one tool that was versatile and customizable.

In the course of his market research, Harris found a tool that suited his needs to a T: KINVENT's K-Deltas Force Plates. A wide variety of tests can be run on the Bluetooth plates, which give users advanced biomechanical data. That data can be used to assess an athlete's readiness for sport, or to help increase performance.

Harris purchased the plates from JLW Instruments and found them to be "very helpful." They even put him in touch with another physical therapist who uses KINVENT products.

"I asked him nitty gritty PT questions to see what was possible," said Harris. "It was great to have that sounding board."

Once Harris received the plates, he took them on the road to test a team of 40 high school lacrosse players.

He conducted the same three tests he ran on the baseball team – this time with the plates. The time it took him to complete the tests? 50 minutes.

And the jump tests that used to take around 10 minutes to set up? With the plates, set up only takes 30 to 40 seconds, and the numbers are "completely accurate," according to Harris.

With the plates, "I can spend more time on the stuff that matters," he said.

Return to Sport with Confidence

Harris doesn't just use the plates for preventative testing – they've also become an integral part of his rehabilitative care.

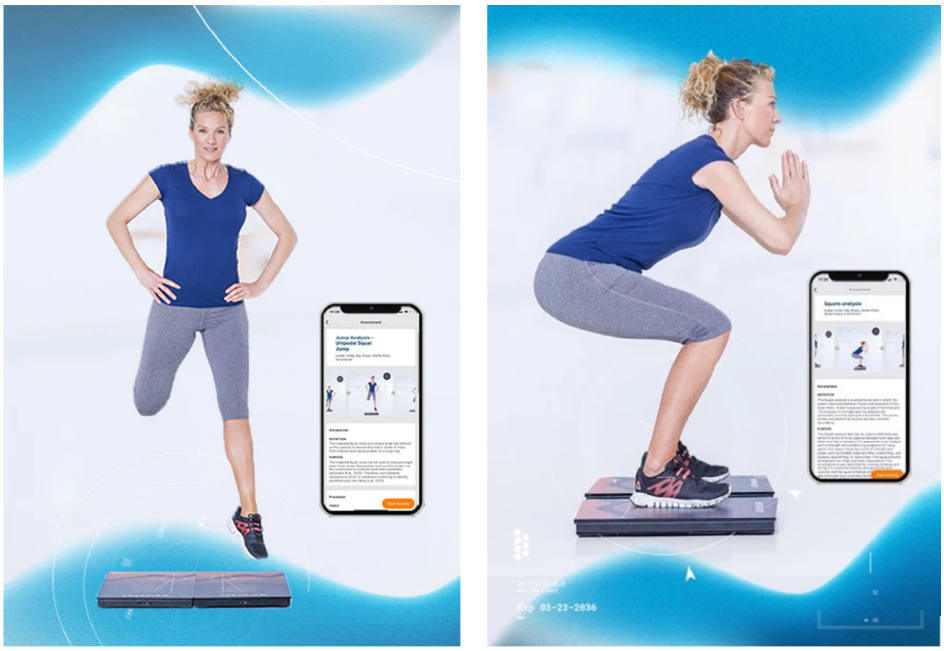
"There are certain benchmarks you have to hit from a strength and power perspective to know you are ready to go back on the field," said Harris. "KINVENT gives you completely accurate numbers and peace of mind. Those numbers can confirm you are ready to return, or guide treatment if you aren't there yet."

The plates have been particularly helpful when Harris works with patients recovering from upper body injuries and surgeries. According to Harris, many tests that assess upper body strength and power – like pushup analyses – are difficult to measure quantitatively. When those assessments are conducted without digital tools, Harris says he must "rely on [his] eyes and what the patient reports feeling."

Even when tests – like the hand and shoulder test – can be "MacGyvered" with weights and straps to produce numerical data, "there are a lot of variables that are hard to account for," according to Harris. And the testing itself isn't "clean, easy or efficient."

The plates changed that. While Harris still uses his expert eye to monitor patients during assessments, he also uses the plates – which give him numerical data in real time on the KINVENT Physio App. That data gives him confirmation that "what he is seeing is what the device is seeing too."

> *When athletes come and see me, they know there will be numbers. That way, we all know that when they return to their sport, they are returning at 100%.*
>
> - Dr. Nate Harris



KINVENT's K-Deltas Force Plates collect invaluable biometric data that can be used to guide rehabilitation plans and improve athletic performance.

Another thing the plates measure that analog testing struggles to capture is power. Power – how much strength an individual can exert quickly – is a critical piece of the return to sport puzzle.

"There's a difference between being strong and being powerful," said Harris. "It's relatively easy to assess strength. It's more difficult to assess power."

That's because precisely calculating power with manual tests is nearly impossible. Luckily, the plates measure *time* in addition to strength, so they can easily determine how much power a patient exerts. With the data from the plates, Harris can adjust rehab plans to help athletes increase their power – and accelerate healing.

Enhanced Accuracy, Engagement & Validation

"The plates are faster, easier, more reliable, more accurate, and streamlined from a therapist perspective," said Harris who, as a self-described "nerd," always wants to ensure his numbers line up. "The numbers I get from KINVENT are a huge help for my patients."

Those numbers are critically important in both preventative and rehabilitative care, and strength and conditioning programs. They boost accuracy and engagement and help validate what patients patients are feeling – all hallmarks of pro athlete-level care.

Accuracy

One of Harris' patients has struggled with on and off elbow pain for some time. As is customary, Harris had the patient working to strengthen the injured limb. Unfortunately, the pain hadn't fully subsided.

When the plates arrived, Harris had the patient perform push-ups on them. The data captured by the plates showed the patient was using the injured arm 20% more than the non-injured arm. It was valuable data, that even the most seasoned therapist would never be able to capture with his or her eyes alone. With the data in hand, Harris adjusted the plan to lighten the patient's training regimen.

The patient's experience is just one example of how the plates "drive better outcome" because, according to Harris, "you don't have errors that might normally slip through."

Those "error-less" results guide Harris' decision making in the rehab process and help him capture more reliable baseline numbers in preventative assessments. Now, instead of estimating a patient's readiness for sport or guessing at red flags, his decisions are based on *numbers*.

The numbers also provide greater consistency and standardization – a sea change for field that typically relies on "feel" and guesswork.

"What I see or assess could be wildly different from another physical therapist," said Harris.

The plates remove inconsistencies and guessing from the process – and make it easy for patients to progress without having to see the same therapist for every appointment.

Engagement

When Harris travels to schools to conduct athletic performance assessments, the numbers stoke the students' competitive spirits.

"Now that they have numbers to compare, they get really into it," said Harris. He added that it isn't unusual for students to retake tests to vie against their teammates for better numbers.

That level of engagement can be rare when testing produces data that is more qualitative than quantitative. When patients have hard numbers to compare – instead of more general feedback – they are more likely to remain motivated. That motivation doesn't just express itself as friendly competition among teammates – it also pushes individual patients to continue to train and engage with the physical therapy process.

Harris has seen this in his own practice since receiving the plates. Weeks ago, one of his patients, a recreational golfer, completed leg strength measurements with the plates. After practicing on the green, the golfer *felt* his strength increasing – but he wasn't sure whether it actually had. He returned to Harris who re-ran the tests. Testing confirmed that the golfer's strength had, in fact, improved.

According to Harris, the numbers increased his patient's enthusiasm about training, because he knew "the numbers don't lie."

Validation

For the past two and a half years, Harris has treated a college soccer player for a variety of conditions. One small, nagging issue the patent struggled with was mild hip pain that flared whenever the season ramped up. Because the pain ebbed and flowed, she wasn't sure whether it was all in her head – which started to knock her confidence.

To alleviate her concerns, Harris conducted tests with the plates. The tests provided data that *confirmed* that deficiencies existed.

"It was validating and important to her to realize, 'I'm not a wimp – there is a reason why I'm not feeling 100%,'" said Harris.

He adjusted her training plan using the data from the plates and, as a result, the soccer player reported to Harris that it was "the best she ever felt at the beginning of a season."

Bridging the Care Gap with KINVENT

Harris' goal to bridge the care gap between professional and amateur athletes – and the philosophy behind his practice – was an admirable one. The K-Deltas Plates allowed him to deliver on it.

"With KINVENT, you're able to assess instead of guess," said Harris. "That's the best way to progress in physical therapy as well as strength and conditioning. Having as much data as possible is the way forward."

About KINVENT

Founded in 2017 by a biomechanics engineer, KINVENT utilizes its engineering background and innovative capabilities to help professionals assess, motivate and follow-up a patient's progress involved in all fields of biomechanics equipment, sports and rehabilitation. KINVENT technologies are light, wireless, precise and user friendly. Since the company's founding and invention of the KINVENT Physio App, the KINVENT product line has become a crucial and central element in physical therapy care and has been adopted by professionals around the world, including clinics, hospitals and professional sports teams.

More: https://k-invent.com

About JLW Instruments

JLW Instruments provides testing consultation, sales, training, servicing, and calibration of force instruments, material testing machines, torque instruments, pressure/temperature instruments and industrial weigh scales. Testing requirements are reviewed by factory trained application specialists who will recommend the most appropriate instrumentation based on experience distributing and servicing products from many manufacturers over the past 30 years. JLW's service department has been A2LA accredited (Certificate #1753.01) since 2001. JLW is also a factory authorized and exclusive calibration provider for the revolutionary KINVENT line of digital, wireless measuring devices, including dynamometers, movement and pressure sensors, and force plates.

More: https://jlwforce.com