

Use of Technology in Rehab and Throwing Programs for Professional Baseball Players

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Over the past several years, as the number of throwing injuries, particularly UCL injuries, continues to rise, there continues to be debate in the industry about what constitutes a safe and effective return to throw progression. Are we going too slow? Too fast? How many throws? What distance? How hard should I throw? These are all questions asked by players, ATC's and MD's alike.

Increasingly more people are turning to the use of technology to help them guide some of these decisions they are making by providing objective data. In this article we will discuss the use of the Pulse (Motus) sleeve, Trackman and the radar gun as 3 pieces of technology that are commonly used in return to throw programs.

The Pulse, which was formerly known as motus, is another tool frequently used when throwing and designing throwing programs. It is a small sensor which is worn in a sleeve or strap placed below the elbow while throwing.

It measures and collects different pieces of data when throwing, including number of throws, arm angle, arm speed and elbow torque. It also measures high effort throws which is based off of the elbow torque data. This can be used to measure total workload, calculate acute to chronic workload ratios and monitor different metrics. This data can be used to adjust, design and monitor throwing programs.

One of the major advantages of using this is to attempt to monitor and measure throwing intensity. Arm angle varies from player to player, but you can use that number to see what is normal for an individual. This can let you know if throwing mechanics are changing. Asking a player to subjectively throw at a certain intensity is unreliable and it can be difficult to understand the total workload from throwing without knowing intensity. The metrics provided can offer objective data.¹ You can use the number of high intensity throws, based off elbow torque and arm speed, to gain a

better understanding of how difficult the throws have been.

Research shows that injury risk increases when the acute to chronic workload ratio exceeds a certain level.² By having the pulse data, you can view and graph a more accurate workload. This can be used to adjust a throwing program to prevent intensity from increasing too quickly.

Radar guns have long been used to measure the velocity of pitches and throws alike. They can be used as part of a return to throw program as a objective way of monitoring intensity. If you are able to continually objectively monitor intensity then you should be able to gradually increase the stress across the injured area and potentially provide a more gradual and appropriate ramp up in throwing. Studies have shown that as ball velocity increases, so does the amount of varus torque across the elbow joint. The higher the torque, the higher the stress on the ulnar collateral ligament.⁴ However at set speed (ex 80 MPH) in one pitcher does not place the same amount of varus torque as another pitcher. Using velocity to measure the increase in intensity works great to perform a gradual build up over time for the same athlete. However, where the starting point should be may differ greatly between athletes.

Another tool used to track multiple metrics is Trackman. Trackman can be used to provide objective data on multiple things such as ball speed, arm angle and release point as well as others. Previous to having this objective data most throwing programs and mound progressions relied on rate of perceived exertion (RPE) to measure intensity level. Studies have shown that even decreased RPE's potentially do not lower torque and other forces across the elbow joint.⁵ This puts healing tissue at risk of facing higher loads than intended.

Arm angle and release point are also important data points to monitor as studies have shown that more lateral release points and lower arm angles tend to create higher forces across the elbow joint.⁶

These are just a few of the ways that technology can play a role in the rehab process and can help provide coaches and trainers with data to help guide the return to play progression for players. As the technology evolves and improves, it will be important to stay up to date with new tech and evaluate its potential usefulness in guiding these return to play progressions.

References

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