Workload and Recovery – A Team Approach

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Recently there has been increased popularity in the use of recovery modalities in athletics to help athletes better prepare for subsequent bouts of work in training and competition. However, without fully understanding workload, it is difficult to assess how much recovery is necessary and which modalities are most effective in a team environment.

In 2020 we were faced with a new challenge in sports – the uncertainty of when competition would return. Many athletes' seasons were cut short or delayed, resulting in them training remotely to remain "ready." Some of our players were left without access to weight rooms, fields, bullpen mounds, and even good quality baseballs to throw. As clinicians, we could not actively monitor their work and had to rely on what they told us. Ultimately, when teams finally gathered to restart their seasons, it was clear that players were at different levels of preparation for the season. We had to navigate increasing workloads safely while maximizing recovery during the quick ramp-up in Spring Training 2.0 and the shortened season.

How Do You Calculate Workload?

Innings limits and pitch counts are two of the most well-known methods utilized in baseball. Pitch Smart outlines pitches thrown and required rest days that have been implemented in youth baseball programs nationwide. In professional baseball, we use additional methods to more accurately quantify workload such as Motus sleeves, radar guns, heart rate tracking and Rating of Perceived Exertion (RPE) surveys. For pitchers, there are multiple factors including pitches thrown, innings pitched, number of game appearances and differences in daily throwing variability (e.g., number of total throws, throwing intensity, long toss distances, flat grounds and bullpens) that can affect daily workload.

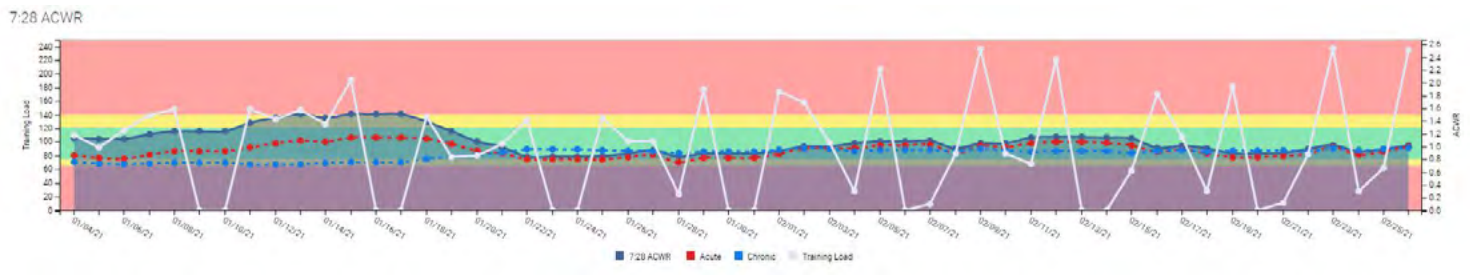
Furthermore, an individual's height, weight, throwing mechanics, elbow torque, shoulder torque and hip-shoulder separation have been correlated to injury and could be considered when devising individual workload calculation.

For position players, total number of swings, throws, ground ball and/or fly ball reps, in-game sprints, games played and number of at-bats can be tracked over time. More recently, there has been emphasis on calculable metrics such as swing speed, exit velocity, running speed and in-game running volume that can help determine workload. However, with both pitchers and position players you must remember that all athletes are different and their bodies each have different reactions to work.

Where Does This Leave Us?

It is worth noting that no study, to date, has definitively declared any single methodology for calculating workload to be the best. Therefore, any method of calculating workload can be valuable if the staff works together to maximize their time and resources in determining and consistently applying it with athletes.

By observing the numbers of swings, throws and sprints, or simply tracking the amount of time spent on the field, we can standardize how we track daily activity. Monitoring workload over time, regardless of manner, can be used to calculate "acute work" (work done over the last week) and "chronic work" (work done over the last month) for individual players. These metrics can then produce an Acute-to-Chronic Workload Ratio (ACWR). The staff can then track this ACWR to observe if there are large spikes or dips relative to workload that may affect performance in the day(s) to follow. For example, heavier acute workloads can cause spikes, and days off



from activity can cause dips. The ACWR can be used to help maintain an even workload or to progressively increase workload safely without applying too much work acutely, possibly resulting in injury. As research in this area progresses, we may learn more about how to optimize which metrics we input into the ACWR to further prevent injury and improve performance. In the meantime, we can utilize ACWR to help us be more targeted in our application of recovery modalities based on daily tracking.

How Do We Recover?

Multiple modalities currently on the market purport to help aid in athletic recovery. Passive recovery tools such as pneumatic compression devices (e.g., Normatec and Rapid Reboot), electrical stimulation (e.g., H-Wave and Marc Pro), percussion massage guns (e.g., Theragun, Jawku and Hypervolt), cryo-chambers, infrared saunas, whirlpools, nap stations, float pods and massage therapy are all common recovery modalities the players use on a daily basis between and after training and game sessions. Active recovery methods such as stretching, heart-rate zone training, meditation and breathing exercises can be utilized to help players feel rejuvenated. On days that acute workload spikes, passive recovery methods can be beneficial to limit energy expenditure while allowing physiological recovery processes like increased blood flow and lymphatic drainage to occur and limit inflammation.

When workload is not as high, active recovery allows athletes to restore their bodies without dropping the acute workload too low. Layering passive and active recovery methods can help an athlete to feel their best for their next bout of competition or training.

Additional factors that affect recovery include sleep and nutrition. Optimizing sleep patterns, diet and supplementation can help the body heal and recover on a daily basis. The body requires adequate amounts of sleep in order to utilize many of the natural processes that help with recovery. The normal population requires on average seven to eight hours of sleep per night, but athletes often require upwards of nine or 10 hours of quality sleep per night in order to fully restore their bodies. Furthermore, dietitians can recommend adjustments to caloric and carbohydrate intake to match training and competition demands. They can also offer food selection to enhance desired adaptations, and even provide necessary supplementation and functional food recommendations that help to restore the body.

In conclusion, we must always remember that recovery is an individual approach. What works for one athlete may not work for another, and what is initially effective can become less effective over time. Because of the wide-ranging nature of workload tracking and the multifaceted, personalized nature of recovery, it is necessary to have continuous communication among your staff and with each player. Each staff member on the team is an integral part of the process. Coaches must help to monitor and moderate on-field activities (e.g., throwing, hitting, defense). Strength coaches will need to modify workouts to meet individual daily needs (e.g., mobility, flexibility, stretching, strength training, power training, sprinting, low-intensity work). Dietitians help with prescribing individualized nutrition plans specific to caloric needs.

The medical staff can compile all of this information and then formulate the appropriate recovery plan for each individual to help them restore their body. In a team atmosphere, it is necessary to work together to monitor an athlete's workload and utilize recovery modalities to keep them performing at their highest level.