In the never-ending, constantly-evolving pursuit of maximum athletic efficiency, it's no surprise that technological advances are playing an increasingly larger role in that endeavor. One such approach being employed to enhance player performance involves the use of global positioning system gadgetry.

According to a new science report [1], a team of researchers in England say they're the first "to monitor injury risk using the GPS technology used to track players' speed and acceleration -- from both training and competition in football," or soccer, as it's known in the United States. The overarching concept is that if a correlation can be established between the amount of sprinting players do, and the related injuries they sustain during pre-season training, then practice sessions can be altered to reduce injurious situations and keep players on the field longer.

Lead researcher Laura Bowen from the University of Birmingham teamed up with the Southampton Football Club to track these potential correlations by analyzing the play of 32 elite youth soccer players, who were on average 17 years old.

According the published study [2], "Workload was quantified using GPS, with data collected from all on-pitch [soccer field] training sessions and matches. The GPS units (Viper V.2, StatSports, Ireland) were placed between the scapulae of the players in bespoke vests. These units sampled at 10?Hz and the accelerometers at 100?Hz. Following each session, the data were downloaded using the specialised analysis software."

What they found, summarized in the report [1], was that:

- High level of acceleration over a three-week training period was the strongest indicator of overall and non-contact injury risk;
- High total distance (in excess of 112km) covered over a four-week period and high weekly total loads significantly increased the risk of overall and non-contact injuries;
- Moderate-to-high levels of distance covered at high speed resulted in higher overall and non-contact injury incidence respectively; and
• Very high weekly total loads and intense levels of short bursts of speed were significantly related to a higher risk of contact injury.

Similar studies have previously been conducted in Australia focusing on its version of football, as well as cricket and rugby. But this is reportedly the first focusing on European soccer.

"Our research has huge practical and scientific application. It expands on a recent body of literature in rugby league and cricket which has proposed that the prescription of workloads may be more indicative of injury than the load itself," Ms. Bowen said.

"The results of our study demonstrate this, with high, excessive workloads associated with the greatest injury risk. However, when the players were exposed to these high loads progressively, over a period of time, the risk of injury reduced significantly," she continued. "Ultimately, players who safely train harder, may develop a greater resilience and tolerance for the intensity and fatigue of competition by increasing their physical capacities."

The findings were published July 22 online in the British Journal of Sports Medicine, in a paper entitled, "Accumulated workloads and the acute: chronic workload ratio relate to injury risk in elite youth football players." Moreover, they are being used to create initial guidelines for youth soccer leagues, to help players ward off injury.

Injury-prevention and performance-enhancing technology, using GPS-information collection methods, has apparently been around for some time now and it's gaining in popularity. For instance, companies like GPSPORTS, which states it was formed in 2000, bills itself as a developer of "sophisticated performance monitoring devices, which incorporate advanced GPS tracking with heart rate and accelerometer monitoring." The firm says that its technology can be used by coaches who "can objectively decide whether an athlete is fit or fatigued leading into match-day."

Since the sample size of the youth soccer study was relatively small, it's hard to determine whether this approach currently has wide application. Another drawback was that the study focused on just one age group, but the research has to start somewhere. And given the way technology has greatly helped to improve athletic performance in many sports, in other ways, it stands to reason that this method to injury prevention has a good chance of scoring.