

TECH IN TENNIS

Propelled by technology and access to wide-ranging information, athlete health, safety, and performance have reached new heights of interest and innovation. A new era of rapidly expanding sports intelligence and data analysis is here, with a focus on individualized and personalized programs.

There are two major drivers fueling the growth of personal sport technology - rapid advances in device and software development, along with an ever-increasing desire for more individualized and personalized programs.

The **Internet of Things (IoT)**: the ability of objects to transmit and receive data via the internet. Wearable sensors and complementary intelligent devices can capture massive and continuous amounts of information in real-time – including the body's response to physical activity and recovery, and periods of sleep and rest. These new technologies are light-weight, non-intrusive, affordable, and able to provide access to personal data previously only obtainable in the performance laboratory.

The use of **Big Data Analytics** in sports. From the Internet of Things comes trillions of pieces of information daily. The ability to put this information into useful context, analyze the data, and interpret the relevance to an individual or a larger group of athletes will provide **tremendous insight into health and athletic performance.**

“The power of wearables comes from connecting our senses to sensors.”
-Matt Miesnieks, CEO of Dekko

WEARABLE TECHNOLOGY IN PROFESSIONAL SPORT: ESSENTIAL OR EXCESSIVE?

Numerous professional athletes use wearable sports technologies, including smartwatches, fitness bands, and embedded sensors (in clothing, patches, or equipment). Wearables for health, fitness, and athletic performance, and corresponding tools for coaching, monitoring training, prompting behavior change, and tracking development, provide direct access to visual feedback and personal analytics. Many wearables have evolved to be all-in-one platforms that record various measurements.

Typical Measurements Include:

- Real-time heart and breathing rates
- Heart rate variability
- Blood oxygen
- Muscle and brain activity
- Skin and body temperatures
- Sweat content
- Global Positioning System (GPS) parameters to track speed, acceleration, and movement
- Biomechanics, stress levels, and sleep patterns can also be clarified and tracked.



Is all this collection of data essential to athlete health and performance or is it excessive?

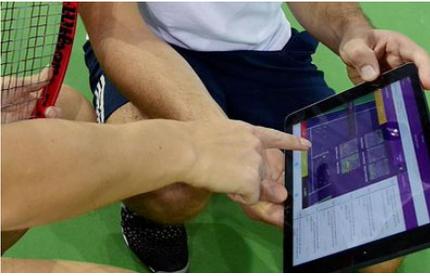
Is the data valid and reliable?

- It is too early to truly validate the science used by many technology companies. Many products use protected methods to present information and make recommendations that are not clearly understood by the consumer.
- This makes it difficult to determine the accuracy of the devices. Players and coaches need to carefully examine the data and recommendations to find the technologies that seem to provide the most valid, reliable, and practical insights.
- So far, there is no single, independent source for information on validity and reliability testing available to inform players and coaches what works and what does not for sports technology.

Is their use effective?

- There is very little research to support the effectiveness of wearables in professional sports.
- It's critical that athletes and coaches use a technology that truly enhances their performance or coaching and not use ones that make analysis more complicated, inaccurate or unreliable.

- The most useful technologies to date are the ones that turn a pen and paper process into an automated process.



The WTA, in partnership with SAP, provides players and coaches with access to valuable data and insights. SAP Tennis Analytics (coaching tablet solution) provides real-time match data at your fingertips during matches, and allows coaches to share visual aids to players during on-court coaching breaks. Away from the matches, coaches and players also have access to the SAP Tournament Performance Center, an online portal that provides access to even more data and information, and which can be personalized by each user. While SAP Tennis Analytics has been designed to present simple and digestible information so as to not overwhelm the players or coaches during a match, the SAP Tournament Performance Centre unlocks the data and information for coaches to use in analysis, scouting, and preparation. The courtside solution is only accessible via a WTA-authorized tablet. The SAP Tournament Performance Centre can be used anytime, from anywhere on a website, tablet, or mobile device.

What about data security?

- Wearable sports technologies may collect your sensitive personal data, such as health and medical information or financial information. A leak of this information could result in hackers stealing your identify or posting embarrassing information about you online.
- Before selecting a technology and inputting your personal data, do your homework on the company that owns the technology. Does the company have a history of data protection violations or security breaches? Review the company's privacy policy and terms of use to understand how the company maintains the accuracy, security, and control of the personal data it collects; how it uses the data, and whether it provides data to third parties.
- Avoid oversharing information. For each type of personal data you share, ask yourself why the company needs it and how they will safeguard it. Is sharing the information necessary for the technology to work?
- Keep your devices secure and password protected. Use strong passwords for your laptop, devices, and accounts.
- Note that the companies you share data with may store your data on servers in countries other than where you are located. The data protection laws in those countries may not be as stringent as those of your country. Data security breaches are common, and your rights and remedies may be limited if your data has been shared internationally.

New portable technology that shows the most promise?(Examples do not imply endorsement.)

- Accelerometers and physiological monitoring that give you more accurate insight to how hard you work in any given day or other time frame. (e.g., Zephyr™ Performance Systems, <https://www.zephyranywhere.com>)
- Breathing and mindset applications to teach psychological strategies, and sleep monitoring. (e.g., Spire, <https://spire.io>; ActiGraph™, <http://actigraphcorp.com/solutions/sleep-assessment>).
- Tracking and coaching applications that are easy to use on your phone. (e.g., Bridge™, <https://bridgeathletic.com>).
- Devices that intelligently use your measurements, provide useful feedback to you, and customize reports and recommendations based on your individual needs.

WHAT SHOULD THE PROFESSIONAL TENNIS CONSUMER (ATHLETE OR COACH) DO?

Before selecting a device, players and coaches should ask themselves three questions:

1. Why do I want to measure and track something? Will the information from a device allow me to avoid injury, enhance performance, or tell me something useful that I don't already know?
2. What does the technology really do? Do I understand it, and is it simple enough to use as an athlete or coach?
3. How does the device change the way I (or my player) move, train, play, recover, or plan my schedule?

Players and coaches are advised to go slowly and only introduce technology that they understand and can easily use to measure and track things over time. Work with a physician or reputable qualified sports physiologist who can help you use the information being provided by your devices.

WHAT'S AHEAD FOR THE WTA?

The WTA Sport Sciences and Medicine team strives to provide the most accurate, evidence-based information to WTA athletes and coaches to improve athlete's performance and health. Sport technology and analytics innovation, combined with sport-specific player education and conducting informative research, all assist the SS&M team to deliver cutting edge programs for the 21st Century to enhance your performance and your health.



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