

Editorial

Only what is necessary: The use of technology in cycling and concerns with its selection and use

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Today, advances in technology, wearables and complex data analysis have revolutionized the world of sports science in general and endurance sports in particular. The fitness-related technology industry has been valued at \$100 billion over the past year 2022 and wearable technology tops the ACSM's list of hot topics (Thompson, 2022).

A cyclist can generate a huge amount of data just by getting out on the bike and recording their activity with an onboard computer or mobile app. This not only includes data on the exercise itself, such as exercise volume or intensity, but also the relationship between internal and external load, and the role of weather conditions in the physiological response of the athlete. Furthermore, thanks to technology, it is very easy to monitor data outside of training that can influence the adaptive process and the cyclist's performance. Metrics such as heart rate variability or sleep quality are now easy to collect through different wearables (Cao et al., 2022) or even very low-cost mobile apps (Moya-Ramon, Mateo-March, Peña-González, Zabala, & Javaloyes, 2022; Plews et al., 2017).

However, just because we are able to monitor so much information does not mean that it is useful for improving the sports performance of our athletes. In this sense, we believe that we must be critical when it comes to implementing any new technology or

trend in the training process. The first thing we should know is whether there is scientific support for the use of that new gadget or wearable. For example, core temperature is of great importance in the mechanisms that produce fatigue and exhaustion in endurance sports. A few years ago, a device came on the market that estimated this measurement in a non-invasive way and we saw many top cyclists and runners wearing it. However, a study showed that it was not a valid device for measuring core temperature (Verdel et al., 2021). Or, for example, NIRS devices claim to measure haemoglobin in the blood, but when tested against blood tests find no relationship, as well as obtain dubious results when adipose tissue increases (Gandia-Soriano et al., 2022).

Another aspect to consider is the volume or threshold of data that an athlete can process and assimilate. In practice, many professional athletes prefer to ignore certain information and not be influenced by certain data, an example of this is the requests not to mount potentiometers in certain cycling competitions or time trials in order to be guided only by their subjective perception. On the other hand, other cyclists prefer to have as much information as possible and contrast it continuously with their subjective perception during training or competitions, all of which has led coaches and scientists to speak of a personal information threshold, or data threshold (Zabala, 2022). This is something we should consider when



working with athletes trying to optimize their performance. In addition, as coaches we must be aware of the importance of the athletes' awareness during the effort, of being able to know themselves better and better by listening to what their body is saying, making them more and more mature in sporting terms. As we know, the human body has many sensors that provide us with information, but sometimes we must be able to interpret it correctly.

In short, we have no doubt that professional cycling has been revolutionized by the importance and benefits of technology and the data it generates. However, we cannot be blinded to include every device and metric. In this sense, in the age of digitalization, it is necessary for sports scientists and coaches to carefully select and justify which tools are used and which data is shown to cyclists, with the aim of improving their performance, health, and wellbeing.

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