

A simple, cost-effective method for determining aerobic fitness proposed

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Ibai García-Tabar, who holds a degree in Physical Activity and Sports Sciences, believes that the most effective, accurate and cost-effective way of determining the aerobic fitness of sportspeople and specific populations is to measure the blood lactate threshold.

Although this system is already being used by professional sportspeople and teams, it cannot always be extended to amateur sportspeople or patients with limited economic resources because it requires supervision by qualified professionals. That is why in his Ph.D. thesis, read at the Public University of Navarre (NUP/UPNA), the researcher has advanced three new tools for doing this in a more cost-effective, simple way. The first is a [heart rate](#) monitor to measure [aerobic fitness](#) through the rate associated with 90 percent [maximum heart rate](#).

"This system is very practical because no health professionals are needed. We can monitor aerobic fitness without the help of a specialist," insisted Ibai García-Tabar.

The second tool is a [heart rate monitor](#) that makes use of [heart rate variability](#). In this case, monitoring by a trainer or fitness coach would be necessary, because this system involves a special mathematical process requiring more exhaustive control.

The last proposal is a single sample of blood lactate using a lactate analyser, a device similar to that used by diabetics to measure the concentration of glucose in the blood. "The process takes between five

and 13 minutes, and the user can implement it during his/her daily routine. This proposal would enable training intensities to be continually readjusted and the evolution in aerobic fitness of a football player, for example, during his/her final rehabilitation phase following injury, to be monitored more closely. It would also help to evaluate the level of fatigue arising after a period of overload," he said.

Two systems for assessing aerobic fitness

Today, the two most widespread methodologies to determine aerobic fitness are electronic, automated gas analysers and measuring lactate concentration in the blood. The latter became important in the 1980s, particularly in the area of sports. Yet in the clinical area, the assessing of respiratory gases remains the predominant methodology.

According to García-Tabar, although electronic gas analysers to determine aerobic fitness and ongoing sports performance are widespread, they lead to considerable systematic error when the maximum consumption of oxygen is measured. "The solution involves verifying the results once the evaluation is over and checking whether they coincide with the initial calibration. This can only be done using semi-automatic gas analysers."

That is why the researcher is opting for the method that determines lactate thresholds; the reason is that as more variants are taken into consideration, it is more accurate and could be useful for more sectors of the population. "I would particularly recommend blood lactate assessment for seniors and patients, because as maximum oxygen consumption is not measured, the user does not have to be pushed to the limit, and that way, unnecessary risks are avoided."

García-Tabar is hoping that his proposals will result in a practical tool to bring research closer to the real world of sports, because, in his view,

there is a great need for solutions.

Provided by Elhuyar Fundazioa

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