

BOX CLEVER

how to last longer in the ring

by Jon Cree

The ability to gain the advantage, and then see it through over successive rounds to secure victory, is what all boxers strive for. So focusing on staying power seems obvious – but building endurance on aerobic capacity could slow you down just when you need speed to clinch the match. Recent research suggests that high-intensity interval training could give you the best of both worlds.



Having a conversation recently with a friend who has taken up boxing, I wasn't surprised to learn that he had started long-distance running to 'help with his boxing'. 'Rocky did it', he told me – fair point!

This got me thinking: what relationship is there between steady-paced running at five in the morning – and a sport that involves high work-rate rounds that last 2–3 minutes?

It didn't take long to work out that there is only one, controlling body weight. You may also be thinking about the benefits of improved cardiovascular endurance. However, 2009 data indicate that this is not as important as once believed – boxers in general only have an average VO_2MAX when compared to a variety of other sports (Table 1). This may be counterintuitive to

SPORT	VO_2MAX
Skiing (Nordic)	65–94
Cycling	62–74
Rowing	60–72
Skiing (alpine)	57–68
Soccer	54–64
Wrestling	52–65
Boxing	52–64
Swimming	50–70
Basketball	40–60

Table 1. VO_2MAX averages for a variety of sports ($ml.kg^{-1}min^{-1}$)[1]

those of you who have tried boxing training: at the end of a training exercise or even a sparring round, you are definitely breathing heavily!

Fuel advantage?

The heavy breathing is actually in response to the breakdown of lactic acid and also to aid the replenishment of phosphocreatine (PCr) and adenosine triphosphate (ATP) within the muscle. Lactic acid is waste product that must be oxidised (broken down by oxygen) to stop us getting cramp and dropping out altogether. PCr and ATP are our fuel sources, and we cannot carry on without them. So, because all these functions happen via the aerobic system [2], the following association has also been formed: *The better my aerobic capacity, the more quickly I can recover, the harder I can work in subsequent rounds.*

Unfortunately, this relationship is yet to be proven, and research points more towards increasing lactic threshold via high-intensity interval training (HIIT) to achieve greater benefit [3]. Finally, as rounds progress and our ability to replenish our fuel stores become ever compromised (and they will), the contribution of energy via the aerobic system increases. Unfortunately, the



THE HARD SCIENCE

HIIT can be adapted to fit many intermittent, high-intensity sports, although the limiting factors that decrease performance remain constant. These are best expressed through the two main goals of HIIT, as follows:

- to increase storage of glycogen, which can be broken down readily into ATP for use by the body during the beginning stages of movement [6].
- to increase the body's ability to buffer (tolerate) lactic acid, which is produced when there is no oxygen present in the breakdown of energy within the body [7].

tradition. It has been an accepted practice for a long time and was further cemented into boxing culture by footage of the greats, from Joe Frazier through to Ricky Hatton, out for early morning runs. However, there is no suggestion here that they were training incorrectly, as these runs may have been for purposes other than improving fighting fitness.

The 'right' energy

Other benefits of the HIIT method have been reported. For example, research studies in 2005 and 2007 [4,5] showed that it reduces body fat percentages much more effectively than aerobic-focused training. Of benefit here is that, because it requires a much higher work rate, you use the same number of calories within half the time needed for a longer-distance, slower-paced run. The bonus is that you are also training the correct energy system for the sport.

Implement HIIT into your training by following these three steps:

1. Calculate your work:rest ratio and apply this over the duration of a round. Then multiply by the number of rounds you would be expected to fight over. For example, a work:rest ratio of 1:3 assumes 10 seconds of continuous punching, followed by 30 seconds of active recovery (such as foot movement and guarding) So, if a round lasts for 2 minutes, this means you will complete the exercise 3 times per round.
2. Incorporate the main movements required for the sport (footwork, punches).
3. Ensure variation in exercises and intensity.

Knowing this is vital to making your training as sport specific as possible. You can change the exercises (eg, jabs, body shots, sprints, deadlifts); build up to the full round and also ramp up the intensity of the exercise over time – these are your variables.

aerobic system cannot supply energy in an 'explosive' manner – yet another reason not to train your aerobic capacity like an endurance athlete. All signs point to HIIT.

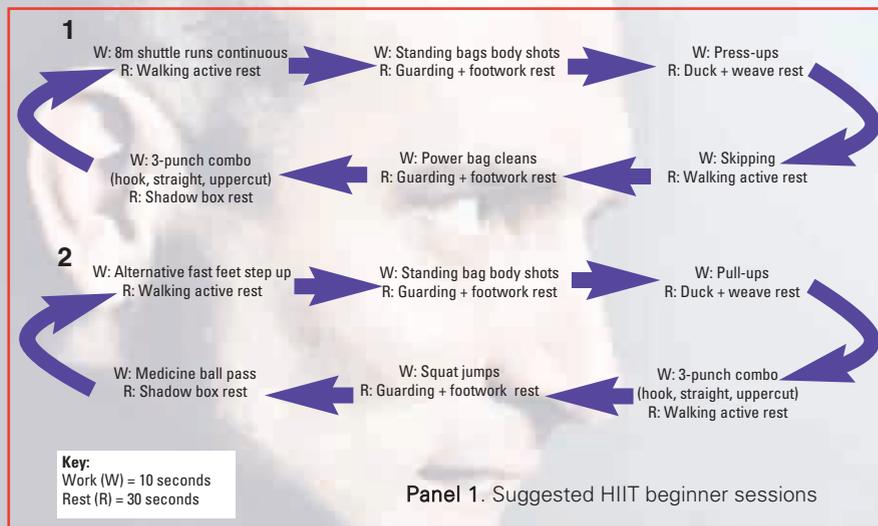
So why do so many boxers undertake distance running? It may be partly down to

Now try it out ...

Using HIIT should allow you to train the correct energy system with the correct movement patterns and save you a lot of time in the process. You might also get a bit more sleep, too.

The two beginner session examples in Panel 1 will give you a chance to weigh up HIIT for yourself:

- Total circuit time is 18 minutes, based upon work:rest ratio of 1:3 and a round time of 2 minutes – with 1 minute active recovery between rounds, which is shadow boxing.
- You can complete the circuit as many times as required. Ensure a complete warm-up and cool-down as usual.



References

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