

1 Type of the Paper (Article, Review, Communication, etc.)

2 Performing high-intensity training following 3 prolonged exercise impacts durability-related 4 adaptations

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22 **Abstract:** Durability refers to resilience to
23 the effects of prolonged exercise on
24 physiological profiling characteristics. The
25 aim of this study was to investigate if
26 performing high-intensity training (HIT) at
27 the end of long low-intensity training
28 sessions enhances durability. Twenty
29 trained cyclists were randomly allocated to
30 one of two four-week training interventions
31 (CON, n=10 and INT, n=10). INT performed
32 HIT at the end of long low-intensity
33 sessions, while CON performed HIT and
34 long low-intensity sessions on separate
35 days. Weekly training was matched for
36 overall volume and time in zones. An
37 incremental test to determine the first (VT₁)
38 and second (VT₂) ventilatory thresholds,
39 and a 5-min time trial (TT), was performed
40 in a rested state (-rest) and after 2.5-h
41 cycling (-2.5h) pre- and post-intervention.
42 Adaptations to VT₁-rest favored CON ($\eta_p^2 =$
43 0.14), although this was not significant ($p =$
44 0.101). There was a greater improvement in
45 VT₂-rest in CON vs. INT ($p = 0.015$; $\eta_p^2 =$
46 0.29). Adaptations to TT-rest favored CON
47 ($\eta_p^2 = 0.06$), although this was not

48 significant ($p = 0.334$). Adaptations to VT₁-
49 2.5h favored INT ($\eta_p^2 = 0.19$), although this
50 was not significant ($p = 0.057$), while no
51 group differences in adaptations to VT₂-2.5h
52 ($\eta_p^2 = 0.19$) were observed. Adaptations to
53 TT-2.5h favored INT ($\eta_p^2 = 0.05$), although
54 this was not significant ($p = 0.380$).
55 Following prolonged exercise, VT₁ was
56 better maintained after INT vs. CON ($p =$
57 0.015; $\eta_p^2 = 0.29$). Group differences in this
58 effect for VT₂ and TT were not significant,
59 but there was a large and moderate effect
60 size in favor of INT ($p = 0.058$; $\eta_p^2 = 0.19$ and
61 $p = 0.272$; $\eta_p^2 = 0.08$). Adaptations to TT rest
62 and TT 2.5h were not different between
63 groups. These data indicate the timing of
64 HIT may impacts adaptations related to
65 durability in trained cyclists.

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