

Supplementary Table S2 and S3. Time to Target Heart Rate and Training Fidelity during HIIT and MICT

All sessions totaled 40 min, including 5-min light stretching before/after. HIIT: six cycles of 1-min high-intensity (80-100% HRmax) followed by 4-min recovery ($\leq 60\%$ HRR). MICT: 30 min continuous exercise (60-80% HRmax). HR was recorded continuously with a real-time ECG (1-s epochs; 5 s moving average; predefined artifact/ectopy exclusion). S2 reports time to target HR (mean $\pm$ SD; minutes with seconds in parentheses): HIIT time to 80%/90% HRmax during each 1 min high-intensity interval (by bout-pairs 1-2/3-4/5-6) and time to $\leq 60\%$ HRR during the subsequent 4 min recovery; MICT time to $\geq 60\%$ / $\geq 70\%$ / $\geq 80\%$ HRmax from session start. Threshold attainment requires sustained ≥ 5 s; HIIT intervals not reaching a threshold within 1 min are right-censored at 60 s. S3 reports training fidelity: (A) HIIT Starting HR, interval-level attainment for $\geq 80\%$ / $\geq 90\%$ HRmax, and exposure (% of 1 min); (B) HIIT time to $\leq 60\%$ HRR, time $\leq 60\%$ HRR, non-attainment (n/N, %), and recovery mean HR; (C) MICT Starting HR, time in 60-80%, time $\geq 80\%$ (with exact seconds), non-attainment (n/N, %), and block mean HR across 0-10 / 10-20 / 20-30 min blocks.

Supplementary Table S2A. HIIT (six cycles: 1-min high-intensity (80-100% HRmax), 4-min recovery ($\leq 60\%$ HRR))

Group / Phase	Target Zone (bpm)	Time to 80% HRmax	Time to 90% HRmax	Time to $\leq 60\%$ HRR	Recovery Mean HR (bpm)
HIIT (bouts 1-2)	134.43-168.04 (80-100%)	0.44 $\pm$ 0.12 min (26 $\pm$ 13 s)	0.79 $\pm$ 0.33 min (47 $\pm$ 20 s)		
HIIT (Recovery after 1-2)	≤ 128.82 ($\leq 60\%$ HRR)			1.08 $\pm$ 0.47 min (65 $\pm$ 28 s)	101.25 $\pm$ 5.31
HIIT (bouts 3-4)	134.43-168.04 (80-100%)	0.33 $\pm$ 0.14 min (20 $\pm$ 8 s)	0.66 $\pm$ 0.25 min (40 $\pm$ 15 s)		
HIIT (Recovery after 3-4)	≤ 128.82 ($\leq 60\%$ HRR)			1.26 $\pm$ 0.58 min (76 $\pm$ 35 s)	102.83 $\pm$ 4.95
HIIT (bouts 5-6)	134.43-168.04 (80-100%)	0.27 $\pm$ 0.16 min (16 $\pm$ 10 s)	0.59 $\pm$ 0.29 min (35 $\pm$ 17 s)		
HIIT (Recovery after 5-6)	≤ 128.82 ($\leq 60\%$ HRR)			1.44 $\pm$ 0.63 min (86 $\pm$ 38 s)	104.15 $\pm$ 5.61

Time to 80%/90% HRmax (min) = elapsed time from high-intensity onset to HR $\geq$ threshold sustained ≥ 5 s; right-censored at 60 s if not reached; Time to $\leq 60\%$ HRR (min) = elapsed time from recovery onset to HR $\leq 60\%$ HRR sustained ≥ 5 s (HRR = HRmax - HRrest; HRrest = 70 bpm); Recovery Mean HR (bpm) = arithmetic mean HR over the entire 4 min recovery. ECG-HR summarized at 1 s epochs with a 5 s moving average; artifacts/ectopy excluded by predefined rules. Units: minutes (two decimals) with seconds as integers when shown; HR as bpm (mean $\pm$ SD); ranges use en-dash (-); counts as n/N (%).

Supplementary Table S2B. MICT (30-min 60-80% HRmax)

Group/Phase	Target Zone (bpm)	Time to reach (min)	Attainment rate (%)
MICT $\geq 60\%$	101.06-134.74 (60-80%)	0.82 $\pm$ 0.36 (49 $\pm$ 22 s)	100
MICT $\geq 70\%$	101.06-134.74 (60-80%)	1.58 $\pm$ 0.62 (95 $\pm$ 37 s)	93
MICT $\geq 80\%$	101.06-134.74 (60-80%)	3.12 $\pm$ 1.27 (187 $\pm$ 76 s)	62

Time to threshold ($\geq 60\%$ / $\geq 70\%$ / $\geq 80\%$ HRmax, min) = elapsed time from session start to HR $\geq$ threshold sustained ≥ 5 s (block-agnostic initial attainment speed); Attainment rate (%) = percentage of participants reaching the stated threshold (≥ 5 s sustain). ECG-HR summarized at 1 s epochs with a 5 s moving average; artifacts/ectopy excluded by predefined rules. Units: minutes (two decimals) with seconds as integers when shown; HR as bpm (mean $\pm$ SD); ranges use en-dash (-); counts as n/N (%).

Supplementary Table S3A. HIIT (high-intensity bouts (1 min))

Group/Phase	Starting HR (bpm)	$\geq 80\%$ attain (%)	$\geq 90\%$ attain (%)	Time $\geq 80\%$ (% of 1-min)	Time $\geq 90\%$ (% of 1-min)
HIIT (bouts 1-2)	103.4 $\pm$ 7.91	91	65	54 $\pm$ 19 (32 s)	22 $\pm$ 16 (13 s)
HIIT (bouts 3-4)	107.8 $\pm$ 8.86	96	70	67 $\pm$ 12 (40 s)	29 $\pm$ 13 (18 s)
HIIT (bouts 5-6)	114.7 $\pm$ 8.04	99	78	78 $\pm$ 18 (47 s)	37 $\pm$ 17 (22 s)

Starting HR (bpm) = 5 s mean HR immediately before each 1 min high-intensity interval; $\geq 80\%$ / $\geq 90\%$ HRmax Attain (%) = interval-level proportions per bout-pair (denominator = 30 intervals, 15 participants $\times$ 2), counted only if HR $\geq$ threshold is sustained ≥ 5 s within 60 s; Time $\geq 80\%$ / $\geq 90\%$ HRmax (% of 1 min) = proportion of the 60 s interval with HR $\geq$ threshold (seconds shown for readability). ECG-HR summarized at 1 s epochs with a 5 s moving average; artifacts/ectopy excluded by predefined rules. Units: % and seconds (two decimals for seconds only if required by journal; otherwise integers); HR as bpm (mean $\pm$ SD); ranges use en-dash (-); counts as n/N (%).

Supplementary Table S3B. HIIT (recovery fidelity, 4-min after each bout-pair)

Group/Phase	Time to $\leq 60\%$ HRR (min)	Time $\leq 60\%$ HRR (% of 4-min)	Non-attainment (not $\leq 60\%$ HRR within 4-min)	Recovery Mean HR (bpm)
HIIT (after 1-2)	1.08 $\pm$ 0.47	73 $\pm$ 14	0/15 (0.00%)	101.25 $\pm$ 5.31
HIIT (after 3-4)	1.26 $\pm$ 0.58	68 $\pm$ 16	0/15 (0.00%)	102.83 $\pm$ 4.95
HIIT (after 5-6)	1.44 $\pm$ 0.63	64 $\pm$ 18	0/15 (0.00%)	104.15 $\pm$ 5.61

Time to $\leq 60\%$ HRR (min) = elapsed time from recovery onset to HR $\leq 60\%$ HRR sustained ≥ 5 s (HRR = HR_{max} - HR_{rest}; HR_{rest}=70 bpm); Time $\leq 60\%$ HRR (% of 4 min) = directly measured proportion of the 240 s recovery with HR $\leq$ threshold after applying the ≥ 5 s sustain rule (computed from the second-by-second signal, not inferred from the time to value); Non-attainment (n/N, %) = recovery intervals not reaching $\leq 60\%$ HRR within 4 min (denominator = 15); Recovery Mean HR (bpm) = arithmetic mean HR over the entire 4 min recovery. ECG-HR summarized at 1 s epochs with a 5 s moving average; artifacts/ectopy excluded by predefined rules. Units: minutes (two decimals) with seconds as integers when shown; HR as bpm (mean $\pm$ SD); ranges use en-dash (-); counts as n/N (%).

Supplementary Table S3C. MICT (30-min)

Block (min)	Starting HR (bpm)	Time in 60-80% (% of block)	Time $\geq 80\%$ (% of block)	Non-attainment ($<60\%$ or $>80\%$ for ≥ 1 -min)	Block Mean HR (bpm)
0-10	97.13 $\pm$ 6.58	62.17 $\pm$ 17.08	0.58 $\pm$ 0.94 (3.48 $\pm$ 5.64 s)	0/14 (0.00%)	104.24 $\pm$ 4.95
10-20	108.62 $\pm$ 4.32	73.11 $\pm$ 11.36	1.37 $\pm$ 2.11 (8.22 $\pm$ 12.66 s)	0/14 (0.00%)	105.68 $\pm$ 4.61
20-30	111.82 $\pm$ 5.37	80.24 $\pm$ 12.98	2.42 $\pm$ 3.07 (14.52 $\pm$ 18.42 s)	0/14 (0.00%)	106.79 $\pm$ 4.83

Starting HR (bpm) = 5 s mean HR at block onset; Time in 60-80% HR_{max} (% of block) = directly measured proportion of the 600 s block with HR in the prescribed band (≥ 5 s sustain rule applied); Time $\geq 80\%$ HR_{max} (% of block; seconds) = directly measured proportion with HR $\geq 80\%$ HR_{max} (≥ 5 s sustain), with seconds in parentheses as the exact conversion: seconds = (%/100) $\times$ 600 (two-decimal rounding); Non-attainment (n/N, %) = blocks where $<60\%$ or $>80\%$ HR_{max} persisted continuously for ≥ 1 min (≥ 60 s) (denominator = 14); Block Mean HR (bpm) = arithmetic mean HR over the entire 10 min block. ECG-HR summarized at 1 s epochs with a 5 s moving average; artifacts/ectopy excluded by predefined rules. Units: percentages and seconds to two decimals; HR as bpm (mean $\pm$ SD); ranges use en-dash (-); counts as n/N (%).