HIIT and Cardio Research to Practice
More Than Tabata - the HIIT Protocol Work-Out Experience

Presented by Helen Vanderburg, BPE, ACE, CFP
Mike Bracko, Ed.D., CSCS, FACSM

1. Fartlek Training
   - Walking warm-up . . . 3 min's.
   - Fartlek running work-out . . . 5 min's.

2. Tabata

   HIIT group, 5 days/week for 6 weeks, 8 sets, 20 sec work at 170% of VO2max, 10 sec rest.

   Benefits - HIIT group improved VO2max by 7 ml/kg/min and anaerobic capacity increased by 28%.
   Remarkable benefits in 4 minutes. Remarkable benefits considering 2:40 min of work. Can we do “Tabata” HIIT with our clients 5 days/week, 3 days/week?

   Work-out: Jump squats as fast as possible for 20 sec/10 sec rest, 8 sets. Passive recovery.

3. Tremblay

   Compared moderate-intensity aerobic exercise & HIIT on fat loss & muscle metabolism.

   Benefits - HIIT group decreased sum of 6 skinfolds nine times less than endurance program.
   10 – 15/15 – 30 sec intervals or 4 - 5/60 - 90 sec intervals. Intensity = 60% - 70% of max. Recovery HR down to 120-130 bpm.

   Remarkable benefits considering total work time =
   Protocol 1 = 1:30 – 7:30 min of work
   Protocol 2 = 4:00 – 7:30 min of work
   Intensity of 60 – 70% can be well tolerated by clients.

   Work-out: 4 forward bounds with run back, #1 - 5 x 20 sec , #2 – 4 x 75 sec, recovery HR 120-130

4. Little

   6 training sessions, 8-12 x 60 sec intervals at approximately 100% of peak power with 75 sec of recovery. Peak anaerobic power is what we do just before collapsing. Is it possible to work at 100% for 60 seconds?

   Benefits - increased exercise capacity on cycling time trials and increased muscle mitochondrial capacity.
   Not very exciting benefits. Increased exercise capacity may be important to clients – 8 - 12 min of work, 8:45 – 13:45 min of rest.

   Work-out: Human Bench Hops 5 work intervals/60 sec at 100%. 75 sec of recovery.
5. Perry

6 weeks of HIIT – Untrained men & women. 10 x 4 min intervals at 90% VO2 peak, 2 min rest, 3 days/week. VO2 peak is highest value of VO2 attained on test.

Results:
- Reduced break down of glycogen (more fat being used)
- Reduced lactate accumulation
- Increased fat oxidation at 60% of pre-training VO2 peak.
- Training power output increased by 21% and VO2 peak increased by 9%.

Benefits - Increased fat oxidation . . . FAT, FAT, FAT . . . can you smell the fat burning!?!?
- 40 min work, 18 min rest . . . this is a lot. Can our clients adapt to 58 min of HIIT?

Work-out: Intensity = 90%, 3 x 4 min intervals, 2 min active recovery.
1. 30 sec Dry Skating
2. 30 sec Plank Arm Wrestle W/Shuffle
3. 30 sec Side Shuffle with Squat Jump
4. 30 sec Burpee Partner Hand Slap . . . repeat.

6. Talanian

8 women, 7 HIIT sessions/2 weeks, 10 x 4 min intervals at 90% VO2, 2 min rest. Total exercise time = 58 min. “Marked increases in whole body and skeletal muscle capacity for fatty acid oxidation during exercise.”

7. Helgerud

40 men, 4 groups:
1. 45 min long slow distance (70% HRmax)
2. 24.25 min lactate threshold run (85% HRmax)
3. 47 reps/ 15 x 15 sec running. 90-95% HRmax /15 sec active rest 70% HRmax
4. 4 x 4 min of interval running, 90-95% HRmax, 3 min of active resting at 70%HRmax).

Results: 15 x 15 and 4 x 4 increased VO2max more compared with LSD and lactate-threshold.

“Practical ‘application – 47 reps/ 15 x 15 = 23.5 min. 4 x 4 min of interval running, 3 min rest = 28 min.

Benefits -
- HIIT increased VO2max more than LSD and LT.
- 15x15 = 5.5% ↑ VO2
- 4 x 4 = 7.2% ↑ VO2
- Remarkable benefits in VO2 for 23.5 – 28 min of work.

Work-out: 15 x 15, 90-95% HRmax, 8 reps, 4 min/16 intervals:
1. 15 sec Lunge Split Jump
2. 15 sec rest
3. 15 sec 4 corner hops
4. 15 sec rest . . . Repeat 4x.

8. Whyte

10 overweight/obese sedentary men. 2-week HIIT, 6 sessions, 4 - 6/30 sec Wingate sprints, 4.5 min recovery.

Results:
- VO2max and Wingate power increased.
- Insulin sensitivity, resting fat oxidation rate higher (24 hrs post-work-out)
- Systolic blood pressure and resting carbohydrate oxidation were lower (24 hrs post-work-out).
- Waist and hip circumferences decrease.

“Practical “application – 6 work-outs, 4 - 6 intervals, 30 sec Wingate anaerobic sprints, 4.5-minute recovery.

9. Baquet

63 kids - 3 groups: 1) Continuous, 2) HIIT, and 3) control. HIIT group: 10 x 10 sec/10 sec recovery, 5 x 20 sec/20 sec recovery, 5 x 30 sec/30 sec recovery, 10 x 15 sec/10 sec recovery, 10 x 10 sec/10 sec recovery, 100 – 190% of max aerobic velocity.

Results: Both groups increased peak VO2 and max aerobic velocity. Authors suggest continuous running can be boring, consider a variety of training programs for children.

Work-Out: Intensity = 100 – 190% max
1. 4 sets - 10 sec Squat Jacks, 10 sec recovery
2. 4 sets - 20 sec Power Squat, 20 sec recovery
3. 4 sets - 30 sec Touch-down Jack, 30 sec recovery

10. Vanderburg - Anaerobic Capacity - Pyramid Training - Recovery during partner ex’s

Work-out:
15 sec - Vertical partner push-ups
30 sec - Human bench jump over
45 sec - Partner crawls
60 sec - Partner squats
45 sec - Partner crawls
30 sec - Human bench jump over
15 sec - Vertical partner push-ups