



## **Short Burst Training: What You Need to Know to Harness the Power of This Time Efficient, Fat Burning Exercise**

### **What is “Burst Training”?**

Burst training consists of very short and intense bouts of activity. These bouts are usually repeated several times throughout the day. Just about anything done at near-maximum effort for 30 to 60 seconds qualifies as “short burst training.”

The idea is that the shorter the time of the exercise, the harder you’ll push. The harder you push, the more likely you’ll reach oxygen debt, which is accompanied by a greater consumption of fuel. Very short bursts of high intensity activity elicit a significant oxygen debt, and your body will set into motion several physiological processes that consume excess calories and fat long after the movement has stopped.

### **Methods for Burst Training**

Short burst training sessions can consist of doing as many push-ups or sit-ups as possible, sprinting 100 yards, or doing as many lunges, squats, or pull-ups as you can, as long as you feel you **MUST** stop or slow down at the end of 30 – 60 seconds. A burst on a stationary bike, elliptical machine, or stair stepper also could work as long as the effort is nearly all-out, lasts no longer than a minute, and is followed by a longer recovery period.

An example of a typical workout on aerobic machines like treadmills, stationary bikes, stair steppers or elliptical machines would be sprinting for 60 seconds, slowing your pace for 2-5 minutes, then sprinting again. You would repeat the pattern several times, depending on your fitness level.

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Running up and down stairs carrying a weight or a sack of potatoes even qualifies as burst training and gets the same benefits as exercises using sophisticated equipment. Even jumping jacks can be done in burst fashion.

If you need ideas, consider doing any of the following:

- Jumping jacks
- Running up and down stairs, optionally carrying a ball
- Squats with optional hand weights
- Push-ups
- Stair-stepper
- Elliptical machine
- Exercise bike
- Treadmill
- Take a walk and do short bursts of fast running or hill climbing

### 60 Seconds is Optimal

In 1993, the *European Journal of Applied Physiology* printed a study showing that sixty seconds is an optimal time for high-intensity activity to elicit an oxygen debt that can elevate fat burning at rest.

*The effects of intensity of exercise on excess postexercise oxygen consumption and energy expenditure in moderately trained men and women. J Smith... - European journal of applied physiology and ..., 1993 - Springer*

## Daily Schedule to Maximize Short Burst Training

- ❑ **Burst out of bed (2 minutes - upon rising):** Do a short, 2 - 3 minute session of burst exercise in the morning upon rising. Doing a 2-minute burst in the morning when you wake up will help to bring blood sugar down in the morning, increase the efficiency of glucose utilization throughout the day, and keep your glucose levels lower if they often tend to start out elevated. Essentially, a morning burst will rev up your metabolism to its peak and burn fat three times more than when you exercise in the afternoon or the evening.
  
- ❑ **During the day - beginner (30 seconds - 3 - 4 times/day):** If you're a beginner or if you're new to exercise, start with 3 - 4 sessions of 30-second, all-out bursts every 4 hours or so to maximize growth hormone. Work your way towards bursting 4 - 8 times per day.
  
- ❑ **During the day - intermediate/reset phase (30 seconds - 4 - 8 times/day):** If you're already comfortable with fitness routines, start burst training at this level. This is the optimal pattern to be in for completing a 30-day metabolic reset phase.
  - ❑ **Optional Optimizing Action:** See if you can adjust the timing of your bursts and meals so that you complete your bursts about 2 hours before each meal. When you do bursts of full intensity exercise lasting 30 - 45 seconds, you stimulate growth hormone secretion for 90 minutes or longer. If you eat too soon after the burst, your growth hormone surge will be inhibited by the insulin surge that occurs after eating. Plan your fitness bursts so they fall somewhere near midway between meals. Bursting about two hours before a meal allows you to reap the benefits of the 90-minute growth hormone surge after the short burst exercise.
  
- ❑ **Burst before bed (2 minutes - 1 hour before bed):** About 2 hours after your last meal of the day and at least 1 hour before bed, do a 2-minute burst of high intensity exercise. This strategy helps you burn whatever sugar is still in your blood stream from your last meal, helps decrease insulin levels, and prepares the body for fat burning during sleep.

## The Benefits of Short Burst Training

The benefits of short burst training are profound and have been documented in the literature for many decades.

Here are some of the findings published in the medical and exercise physiology literature:

- A 2005 study published in the *Journal of Applied Physiology* put non-athletes on a 2-week burst training program that tested their endurance level, a direct measure of cardiorespiratory fitness, before and after. They found that subjects' endurance actually doubled.

*Burgomaster, K.A., et al. 2005. Six sessions of sprint interval training increases muscle oxidative potential and cycle endurance capacity in humans. Journal of Applied Physiology, 98, 1985–90.*

- 30 seconds of maximum intensity burst training elevated growth hormone more than 30 minutes of moderate aerobics and kept growth hormone high longer. *Pritzlaff CJ, Wideman L, Weltman JY, Abbott RD, et al. Impact of acute exercise intensity on pulsatile growth hormone release in men. J Appl Physiol. 1999 Aug; 87(2):498-504.*

- In a study by Gibala et al. six sessions of high-intensity, low-volume interval training and six of high-volume endurance training were compared. They concluded that short burst training is a time-efficient strategy to induce rapid adaptations in skeletal muscle and exercise performance.

*Gibala, M.J., et al. 2006. Short-term sprint interval versus traditional endurance training: Similar initial adaptations in human skeletal muscle and exercise performance. Journal of Physiology, 575 (3), 901–11.*

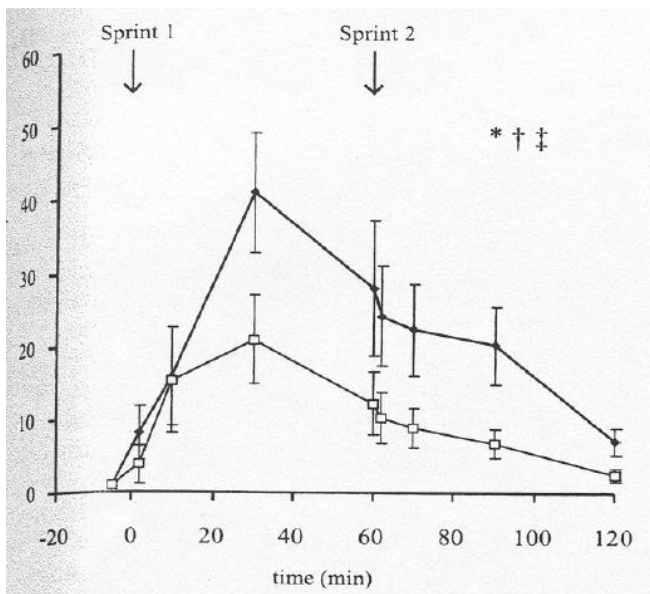
- Another study, published in *Medicine & Science in Sports & Exercise*, showed interval-trained groups achieving significant improvements in calorie and fat burning during exercise with an “exercise session that was 15 minutes shorter than the aerobic group.”

*Treuth, M.S., Hunter, G.R., & Williams, M. 1996. Effects of exercise intensity on 24-h energy expenditure and substrate oxidation. Medicine & Science in Sports & Exercise, 28 (9), 1138–43.*

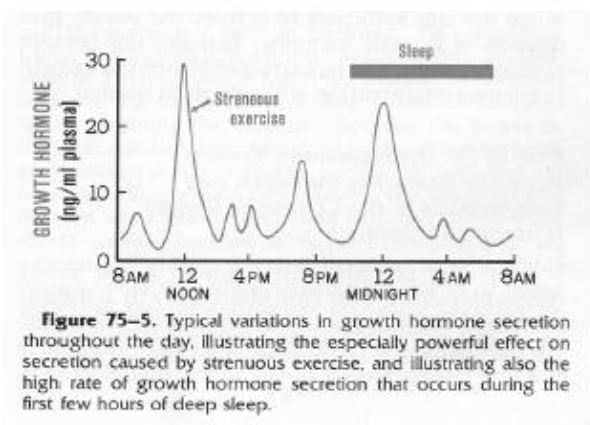
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- Dr. Mark Smith, an exercise physiologist, conducted a 12-week study where subjects exercised in short one-minute bursts throughout the week -- a total of just 12 minutes a week. At the end of the study, the participants had lost an average of 13 inches and improved by more than 12 beats per minute on the **Harvard Step Test**. In another study, conducted at Colorado State University, Dr. Smith and his colleagues compared three minutes of burst training to 20 minutes of traditional aerobic exercise. Three minutes of burst training burned 74% of the calories that the twenty minute period accomplished!

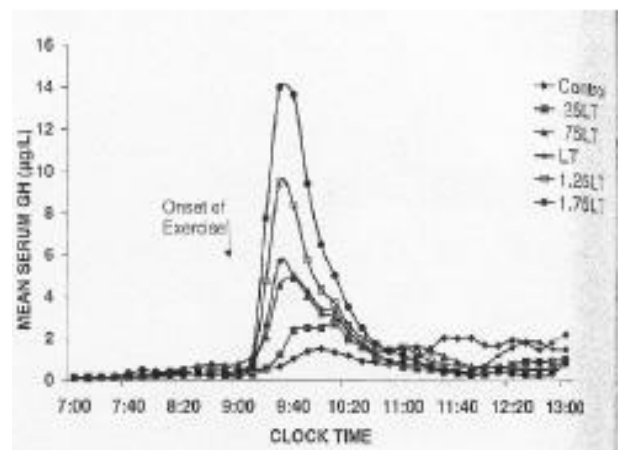
Smith, M.J. 2002. *Sports conditioning—a comparison: Moderate-intensity continuous activity and high-intensity intermittent activity*. www.xiser.com; retrieved Jan. 21, 2009.



- Upper curve is a 30-second all out-burst (sprint)
- Lower curve is 30 minutes of aerobics
- Notice the amount of GH secreted is higher with 30 second sprint
- A second sprint at 60 minutes does nothing to GH
- The optimal timing of sprints (bursts) appears to be 120 minutes



**Figure 75-5.** Typical variations in growth hormone secretion throughout the day, illustrating the especially powerful effect on secretion caused by strenuous exercise, and illustrating also the high rate of growth hormone secretion that occurs during the first few hours of deep sleep.



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- A study in the *Archives of Internal Medicine* showed that exercise intensity had a “13.3 times greater effect on systolic blood pressure, a 2.8 times greater effect on diastolic blood pressure, and a 4.7 times greater effect on waist circumference in men,” than did exercise duration.

*Williams, P.T. 1998. Relationships of heart disease risk factors to exercise quantity and intensity. Archives of Internal Medicine, 158 (3), 237–45.*

- Both Smith and Williams studies, quoted above, demonstrated that HDL (good cholesterol) increased significantly as a result of intermittent — but not continuous — exercise.
- Wisloff et al, in a 2007 study published in *Circulation* concluded that exercise intensity was “an important factor for reversing LV [left ventricular] remodeling, improving aerobic capacity, . . . and quality of life in patients with postinfarction heart failure.” The ramifications of this, “suggest that training programs based on these principles may yield more favorable results than those with low to moderate exercise intensities.”

*Wisløff, U., et al. 2007. Superior cardiovascular effect of aerobic interval training versus moderate continuous training in heart failure patients: A randomized study. Circulation, 115, 3068–94.*

- A 2005 article in the *Journal of Applied Physiology* found that seven 30-second sprints every third day for 2 weeks significantly enhanced fat burning and doubled aerobic capacity of recreational exercisers.

*Talanian, J., et al. 2006. Two weeks of high-intensity aerobic interval training increases the capacity for fat oxidation during exercise in women. Journal of Applied Physiology, 102, 1439–47.*