Innovative: International Multi-disciplinary Journal of Applied Technology
(ISSN 2995-486X) VOLUME 02 ISSUE 04, 2024

High Intensity Training

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Abstract:

This article explores the ongoing debate between traditional endurance exercise and High Intensity Training (HIT). It begins by outlining current exercise guidelines from the US Department of Health and Human Services, which recommend a mix of aerobic and muscle-strengthening activities. The article then introduces HIT as a time-efficient alternative that promises comparable or superior health benefits. Research by Professor Martin Gibala and others is cited to demonstrate HIT's effectiveness in improving metabolic health, muscle development, and cardiovascular fitness. The article also discusses the potential of HIT to manage diabetes and stimulate human growth hormone production, thus offering a comprehensive overview of the benefits and mechanisms of HIT.

Keywords: *High Intensity Training (HIT),Aerobic exercise,Muscle-strengthening exercise, US Department of Health and Human Services,Moderate-intensity aerobic activity,Martin Gibala, McMaster University,Journal of Physiology,Sprint-and-recover cycle,Metabolic boost,Muscle development,Calorie expenditure,Comprehensive muscle activation, Kyle Sevits,University of Colorado,Cardiovascular health,National Institute of Fitness and Sport (Japan),Oxygen intake, Insulin sensitivity,Diabetes management, Herriot Watt University,Human growth hormone (HGH).*

Endurance vs intensity

The conventional belief has long been that when it comes to exercise, more is always better. However, this long-held perspective is being challenged by a new and intense form of exercise known as High Intensity Training (HIT). This has sparked considerable debate between those who advocate for traditional exercise routines and the supporters of HIT. According to the current guidelines issued by the US Department of Health and Human Services, adults aged 16 to 64 are advised to engage in two distinct types of exercise each week: aerobic and muscle-strengthening activities. Aerobic exercises encompass activities that elevate your breathing rate and increase your heart rate, such as brisk walking, swimming, or playing a leisurely game of tennis. On the other hand, muscle-strengthening exercises target all the major muscle groups in the body, including the legs, hips, back, chest, abdomen, shoulders, and arms. The US Department of Health and Human

Services specifies that adults should engage in at least two hours and thirty minutes of moderate-intensity aerobic activity per week, coupled with muscle-strengthening activities on at least two days each week. Despite these clear recommendations, a significant number of individuals fail to meet these exercise targets. The most commonly cited reason for this is a lack of time, which prevents many from incorporating sufficient physical activity into their weekly routines. This understandable time constraint leads many to fall short of the advised levels of both aerobic and muscle-strengthening exercises. The emergence of HIT is seen by some as a potential solution to this problem, as it promises to deliver similar or even superior health benefits in a shorter amount of time. Nonetheless, the debate continues as experts weigh the pros and cons of traditional exercise versus HIT, with no definitive consensus in sight.

Nevertheless, recent research has invalidated the age-old excuse of lack of time. Professor Martin Gibala, hailing from McMaster University in Canada, has conducted a study published in the Journal of Physiology that reveals a surprising finding: engaging in shorter bouts of exercise can yield more significant benefits than long, time-consuming sessions of aerobic and muscle-strengthening activities. This groundbreaking research challenges the traditional notion that more time spent exercising equates to better health outcomes. High Intensity Training (HIT) is the focal point of this new approach. It is characterized by a straightforward yet effective methodology: starting with a warm-up phase, followed by a brief but intense burst of activity lasting typically between 30 seconds to one minute. This intense phase is then followed by a recovery period where the activity is performed at a gentler pace for a couple of minutes. This cycle repeats with another short burst of high-energy activity, succeeded by another recovery phase. This pattern continues with alternating periods of high-intensity exercise and recovery, culminating in a final cooling down phase before concluding the workout for the day. This structured routine of warm-up, intense activity, recovery, and repeat can be adapted to various sports such as cycling, jogging, swimming, and more. Professor Gibala's research underscores the potential of HIT as a time-efficient and effective alternative to conventional exercise regimens. By condensing the workout into brief yet intense intervals interspersed with recovery periods, individuals can achieve notable fitness gains without the need for prolonged exercise sessions. This innovative approach not only addresses the time constraints faced by many but also offers a promising avenue for optimizing fitness outcomes in a busy world.

How does it work?

There exist several plausible explanations for the observed effectiveness of High Intensity Training (HIT) compared to traditional endurance exercise. Firstly, when exercising at low intensity, the calorie-burning process is active only during the exercise period itself. Once you cease activity, the calorie burn also ceases. In stark contrast, high-intensity exercise triggers a sustained metabolic boost that continues long after the workout ends. This post-exercise metabolic effect can last for up to 24 hours, ensuring that calories continue to be burned even during periods of rest. Secondly, HIT contributes significantly to muscle development by promoting muscle growth and replacing fat with lean muscle mass. This muscle-building effect not only enhances physical appearance but also plays a crucial role in improving overall metabolic rate, as muscles are more metabolically active than fat tissue. The third theory centers around the unique sprint-and-recover cycle of HIT, which disrupts the body's usual energy storage patterns. Unlike prolonged low-intensity training, where the body can conserve energy and store excess calories as fat, HIT demands an immediate and substantial energy expenditure during each intense burst of activity. This constant need for energy prevents the body from storing excess calories as fat, leading to a more efficient use of energy resources. Lastly, HIT stands out for its ability to engage a wide range of muscle groups simultaneously. Unlike traditional exercises like moderate jogging or cycling, which primarily target specific muscle groups, HIT activates up to 80% of the body's muscles. This comprehensive muscle activation not

only enhances strength and endurance but also contributes to a higher overall calorie burn during and after the workout. These combined factors make High Intensity Training a compelling choice for individuals seeking efficient and effective ways to improve fitness, burn calories, build muscle, and enhance metabolic health.

Numerous experiments have delved into the realm of High Intensity Training (HIT), with one particularly notable study conducted by a team led by Kyle Sevits from the University of Colorado. This study involved five male volunteers, aged between 25 and 31, who underwent rigorous testing to ensure their cardiovascular health. Assessments of their body composition and resting metabolic rates were also conducted as part of the study's comprehensive protocols. During the experiment, the participants adhered to a specific diet regimen. They were then placed in a controlled environment within a hospital room, where researchers could manipulate air intake and analyze the air's oxygen, carbon dioxide, and water content. These parameters allowed researchers to accurately measure the calorie expenditure of the volunteers. Throughout their stay in the controlled environment, the volunteers followed a strict diet and were limited to activities such as watching TV or using a computer. However, on a designated day, they engaged in a HIT session on a gym bike. This session involved pedaling as fast as possible for five 30-second intervals, with four-minute recovery periods between each burst of activity. The results of the experiment were astonishing. Despite the volunteers engaging in high-intensity activity for just 2.5 minutes, they burned an average of an additional 200 calories on the workout day. This stark contrast in calorie expenditure showcases the efficiency and effectiveness of HIT in a short period. Similar findings have been reported in other experiments as well. In Japan, researchers from the National Institute of Fitness and Sport conducted a study where individuals were divided into two groups. The first group followed a traditional exercise regimen, engaging in moderate-intensity exercise for an hour each day, totaling five hours per week. This group experienced a 9% improvement in oxygen intake. In contrast, the second group's training sessions consisted of eight 20-second intense workouts followed by ten seconds of rest. Surprisingly, this group exhibited a 15% improvement in oxygen intake, surpassing the gains made by the first group despite significantly shorter workout durations. These compelling results further underscore the effectiveness of HIT in improving cardiovascular fitness and metabolic health.

Benefits to health

Optimal oxygen intake serves as a key indicator of good health in adults. However, recent research has illuminated additional health benefits associated with specific workout routines, particularly in managing diabetes. A study conducted by scientists at Herriot Watt University in Edinburgh revealed that incorporating short bursts of high-intensity activity into one's exercise regimen every few days can significantly reduce the risk of developing diabetes. This positive impact is attributed to the beneficial effects of high-intensity exercise on blood sugar levels. Moreover, a study led by Professor Gibala in 2011 unveiled another crucial benefit of high-intensity workouts: a remarkable 35% improvement in insulin sensitivity after just two weeks of training. This improvement is vital as it enhances the body's ability to transport glucose from digested food to our cells, providing essential energy for bodily functions. High Intensity Training (HIT) also yields substantial gains in endurance. A study conducted in 2006 revealed that participants who engaged in eight weeks of high-intensity workouts were able to exercise twice as long as they could before the study, all while maintaining the same pace. This endurance enhancement underscores the effectiveness of HIT in improving overall fitness levels. Furthermore, HIT plays a significant role in fat burning and muscle maintenance. Participants in HIT programs often experience increased fat burning and preservation of muscle mass compared to traditional exercise regimens. One of the most intriguing benefits of HIT is its ability to stimulate the production of human growth hormone (HGH) by up to 450% in the 24 hours following a workout session. HGH not only promotes increased calorie burning but

also contributes to slowing down the aging process. This dual effect suggests that incorporating HIT into one's fitness routine could potentially lead to improved overall fitness and a slower aging trajectory. In summary, High Intensity Training offers a multitude of health benefits beyond enhanced oxygen intake, including reduced diabetes risk, improved insulin sensitivity, increased endurance, enhanced fat burning, muscle preservation, and the stimulation of human growth hormone production. These findings suggest that HIT has the potential to contribute significantly to maintaining fitness and youthfulness over the long term.

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