



MUSCULAR HYPERTROPHY TRAINING IN STRENGTH AND CONDITIONING

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Muscular hypertrophy training is often a topic of discussion in sports where adding some extra mass to an athlete can improve sports performance. Hypertrophy can be simply described as muscular growth as a result of protein breakdown and synthesis. Possible benefits of increased muscle mass typically include an increase in muscular strength, force production, and support and cushioning to help protect the body against external forces (6,7). When engaging in muscular hypertrophy training, the objective is to induce microtrauma in the chosen muscle groups during training sessions to facilitate protein supercompensation during rest (5). Supercompensation must take effect in order to see gains by raising an individual's fitness levels above where they were prior to beginning the workout.

FOUNDATIONAL COMPONENTS

It is important for athletes and coaches to understand it takes commitment to integrate lifestyle choices with hypertrophy training to achieve sport performance goals. Athletes need to be aware how non-training time and nutrition affect hypertrophy. Taken together, recovery, nutrition, and training are three factors that significantly affect hypertrophy. The following sections provide a few research-based tips on these foundational components.

RECOVERY

Recovery is an aspect of training that is often overlooked. It is important to understand the recovery time for larger and smaller muscle groups so changes can be made to the training program. Larger muscle groups take 48 – 72 hr

to recover between intense workouts (3). Smaller muscle groups take anywhere from 24 – 48 hr because of less motor unit recruitment relative to muscle sizes (3).

Sleep is also often overlooked, but it is paramount to help muscle tissue recover and effectively maintain a hormonal balance that induces hypertrophy. Sleep recommendations range anywhere from 7 – 10 hr per night to recover between workouts (3).

NUTRITION

“You are what you eat” is a common expression that means that the body is a byproduct of the nutrients that are consumed. A well-balanced diet with an appropriate amount of macronutrients (e.g., protein, carbohydrate, fat) is essential to optimize gains. Nutrition plays a substantial role in the process of building muscle. When training with a focus on muscle hypertrophy, protein is highly essential for muscle tissue repair and growth. Based on recommendations from the Academy of Nutrition and Dietetics, athletes should consume 1.2 – 1.7g/kg of bodyweight per day of protein to promote muscle growth (8).

TRAINING

Because there is no “cookie cutter” training program that can be applied to everyone, it is recommended that coaches and athletes experiment and blend different methodologies to find what works best for each athlete. However, most athletes can gain strength and muscle mass by performing Olympic-style lifts, power lifts, and auxiliary training. The following are four basic guidelines to follow (5):

1. An exercise overload should be applied.
2. The exercises and training program should be specific to the goals.
3. The exercises and training load (e.g., intensity and volume) should vary upon workout goals.
4. Programs should be adjusted individually.

It takes about 21 – 28 days for the human body to adapt to a new stimulus (4). To account for this adaptation to stress, progressive overload can be applied to continue making gains. The goal of progressive overload is to progressively place greater than normal demands on the exercising musculature (2).

Intensity and Volume

When the training goal is muscle hypertrophy, the vital parameters of training include exercise intensity and exercise volume (5). Intensity can be defined as performing an exercise repetition in relation to an individual's one repetition maximum (1RM) (1). Intensity is a trigger for muscle growth and protein synthesis (1). As intensity increases, volume must decrease, and conversely, as volume increases, intensity must decrease. Volume can be described as the total number of repetitions multiplied by intensity or weight lifted. Intensity and volume should coincide to provide an optimal hypertrophy training program.

As stated earlier, individual adaptations occur and there is no-one-size-fits-all approach. Some athletes will respond better to higher rather than lower reps, while some athletes will respond better to changes in intensity. Optimal results will likely be achieved by individual trial and error to discover what works best. As a basic guideline, volume and intensity recommendations for hypertrophy training are 3 – 6 sets of 6 – 12 reps each per muscle group, with loads of 50 – 85% of 1RM (1).

Training Methods to Consider

Maximum effort activities with multi-joint movements can stimulate higher motor unit recruitment (e.g., fast twitch muscles) and may promote hypertrophy (5). Maximum effort activities relate to a percentage close to an athlete's 1RM to stimulate as many muscle fibers as possible in order to gain strength and size. When programming workouts, it is important to select exercises that will provide the most efficient way to help achieve goals. For instance, if the goal is to add mass, choosing the “big three” lifts (i.e., bench press, back squat, and deadlift) as a foundation may be a good place to start. To increase power and rate of force production, Olympic-style lifts may aid in the development of explosive power (5). Auxiliary methods can be used to improve specific areas and to work on targeted weaknesses.

QUICK TRAINING TIPS

- Increasing the speed of lifts increases power.
 - Consider using higher velocities for the following exercises: bench presses, back squats, clean pulls, and snatch pulls.
- For advanced progressions of the lat pulldown, try variations of pull-ups, chin-ups, alternate grips, and inverted rows.

- Sometimes less is more; listen to the body and arrange for periods of rest and recovery whenever appropriate.

CONCLUSION

The enlargement of the cross-sectional areas of individual muscle fibers contributes to an increase in muscle size (i.e., hypertrophy) (5). Muscular hypertrophy can be accomplished through proper nutritional intake, effective recovery practices, and resistance training. By following the recommendations on these three components provided in this article, athletes can reach their hypertrophy related goals.

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