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# German Volume Training: An Alternative Method of High Volume-Load Training For Stimulating Muscle Growth

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## Introduction

Resistance training may be implemented to achieve differing outcomes such as increased control and stability, hypertrophy of muscle, maximal strength, power, or strength-endurance. Common among the desired outcomes for many trainers is the hypertrophy or growth of muscle.

Typical recommendations to develop muscle hypertrophy include a higher training volume (eg. multiple sets of > 10 repetitions) with shorter rest periods (e.g. < 3-minutes) at a moderate intensity (60 – 75% 1RM). Moreover, some research (1) and a large amount of practical training experience also suggests that a higher volume-load (total repetitions x the weight lifted) is more effective in developing muscle hypertrophy as compared to the same volume (sets and reps) and intensity performed with exercises that utilize lighter resistances.

For example, 3 x 10RM bench press with an 80 kg resistance (volume-load = 30 x 80 kg = 2400 kg) is presumed to be more effective in developing muscle growth as compared to the alternative workout of 3 x 10RM chest flies with 15 kg dumbbells (volume-load = 30 x 15 kg x 2 each = 900kg).

Consequently most trainers and athletes wisely tend to choose a predominance of multi-joint, compound exercises when training to increase muscle growth so that a high volume-load can be attained to help stimulate muscle growth. Aligned with these choices is the typical recommendation to choose multiple exercises (e.g. 2 – 4) to "hit the muscle from every angle" or increase the recruitment of different muscle fibers as typically occurs when performing different exercises for the same muscle groups. But there is an alternative method to the common edict of multiple exercises per body part, gleaned apparently, from the training of German olympic-style weightlifters that has been labeled by renowned Canadian strength coach Charles Poliquin as "German Volume Training" (GVT) (3).

## The German Volume Training Workout

The GVT has been advocated in the coaching and popular media as an effective training method to help athletes gain lean body mass and muscle size (2, 3). According to Charles Poliquin, the GVT workout was purportedly developed by German weightlifting coach Rolf Fesser to aid lifters who wanted to increase lean body mass during the general preparation phase of training (3). The original GVT workout entailed the performance of a larger number of sets per exercise (ten sets per exercise) than is typically recommended for hypertrophy-oriented training (2). Specifically, the original GVT training prescription was 10 sets of 10 repetitions performed with about 60% 1RM or a 20 RM resistance. As achieving a high volume-load with a resistance of around 60% 1RM is the strategic goal of the work-out, the strategy of reducing the resistance by 2.5 to 5kg after a failed set (where 10 repetitions was not achieved) or when the athlete believes they will fail in the ensuing set, is necessary to maintain set lifting volume at 10 repetitions per set. If athletes attempt to maintain the initial resistance and do fewer repetitions per set due to accumulating

| GVT complex #1 (Bench press emphasis) | | |
|---|---|---|
| **Exercise** | **Sets x Reps** | **Intensity** |
| 1a. Bench press | 10 x 10 | Start at 60% 1RM<br>Rest 20 – 30 s |
| 1b. Incline Dumbbell row | 10 x 10 | 20RM Rest 20-30 s |
| 1c. Abdominal curl-up | 10 x 10 | Bodyweight, take 3-s for each rep Rest till 3-minute mark and repeat complex. |
| **GVT complex #2 (Pull-up emphasis)** | | |
| 1a. Pull-up | 10 x 10 | Bodyweight Rest 20 – 30 s |
| 1b. Dumbbell press | 10 x 10 | 20RM Rest 20 – 30 s |
| 1c. Reverse curl-up | 10 x 10 | Bodyweight, take 3-s for each rep Rest till 3-minute mark and repeat complex. |
| **GVT complex #3 (Squat emphasis)** | | |
| 1a. Squat | 10 x 10 | Start at 60% 1RM SQ<br>Rest 20 – 30 s |
| 1b. Leg curl | 10 x 10 | 20RM |
| No abdominals. Rest till 3-minute mark and repeat complex. | | |

## Table 1

Examples of the modified German Volume Training (GVT) workout. The athletes perform one set of each exercise in the order listed (1a, then 1b,then 1c). A new complex of these exercises is started every 3 minutes until all 10 sets have been completed. Each complex is an entire workout.

fatigue, then typically some athletes are only able to perform 3 – 5 repetitions in the last few sets. This procedure drastically reduces potential volume-load and is not the methodology used for the GVT workout.

The rationale of the GVT workout is to totally deplete the muscle fibers involved in one key multi-joint exercise, rather than disperse the fatigue across alternative muscle fibers as could occur with multiple exercises (3). If the exercise chosen was a key, compound exercise, then fiber recruitment would naturally be high anyway, and it was presumed that a super-compensatory growth response would occur as a result of the high volume-load training stimulus that was concentrated in the recruited fibers (3). Accordingly, exercises such as squats, bench presses, deadlifts or pulls, pull- or chin-ups are dominant exercise choices for the GVT workout.

Coach Poliquin has recommended modifying the original GVT so that an agonist-antagonist pairing of exercises can be used with sets of a key agonist heavy resistance multi-joint exercise alternated with sets of an antagonist secondary movement (3). For example, bench press sets may be alternated with a row exercise or pull-ups with dumbbell shoulder presses. The agonist exercise is the main focus of the workout and each GVT complex can be considered as either an entire workout or at least the dominant portion of a workout.

Typically each complex of the GVT starts every 3-minutes, consequently the entire GVT workout lasts 30-minutes. An abdominal training exercise can also be included in upper body GVT complexes, making this workout extremely time-effective, yet "dense" in volume-load (see Table 1). However, if performing a lower body GVT involving squats, deadlifts or pulls it is probably unwise to fatigue the torso with the inclusion of an abdominal exercise.

## Effects of the GVT workout

As yet no long-term studies have been performed to gauge if the GVT workout is more effective in promoting muscle growth or lean body mass gains than the traditional hypertrophy training edict of multiple exercises to attain high load-volume. One study has been performed that looked at the acute effects of an upper body GVT workout upon upper body power output. Not surprisingly, due to the high volume-loads and the fatigue associated with the GVT workout, researchers from Edith Cowan University in Perth, Australia, reported this type of training can exert an immediate negative impact upon power output of 23%, with power still suppressed by 18% even after 7-minutes passive rest (1). As such it must be recommended that the GVT workout not be performed before power training sets or exercises, however this would appear to be an obvious recommendation for any hypertrophy-oriented training dose.

| | Set # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G1 | Reps | 10 (0) | 10 (0) | 10 (0) | 9.9 (0.2) | 9.8 (0.9) | 9.9 (0.3) | 9.6 (1.0) | 10 (0) | 9.8 (0.5) | 9.7 (0.7) | 9.9 (0.5) |
| G2 | Reps | 10 (0) | 10 (0) | 10 (0) | 9.6 (1.1) | 9.6 (1.1) | 9.0 (1.3) | 8.6 (1.1) | 8.8 (1.5) | 9.8 (0.5) | 9.6 (0.7) | 9.5 (1.0) |
| G1 | %1 RM | 61.1 (1.6) | 61.1 (1.6) | 61.1 (1.6) | 61.1 (1.6) | 60.9 (1.7) | 60.6 (2.7) | 60.2 (3.4) | 59.1 (5.4) | 58.9 (5.3) | 58.5 (5.3) | 60.5 (2.8) |
| G2 | %1 RM | 60.8 (1.4) | 60.8 (1.4) | 60.8 (1.4) | 60.8 (1.4) | 60.4 (1.5) | 59.3 (2.9) | 56.6 (4.1) | 53.0 (5.4) | 51.4 (5.9) | 50.4 (7.1) | 57.4 (5.7) |

## Table 2

Average (standard deviation) repetitions and %1RM intensity per set across all 10 sets of the bench press portion of the GVT

G1 = Group 1
Professional athletes in the midst of a traditional hypertrophy program.

G2 = Group 2
Semi-Professional athletes coming off a high intensity, low volume program.

A positive response, apart from muscle growth considerations, may be that the GVT workout can evoke a moderate cardiovascular training effect that were also reported in that study by Daniel Baker and Robert Newton. Figure 1 illustrates the heart rate (HR) responses from two professional rugby league football players performing the bench press focused GVT workout detailed in Table 1. The HR's climb to over 150 and 160 beats per minute (bpm) during the latter stages of the workout with recovery HR's only dropping to 120 bpm (1).

While clearly the cardiovascular effects must impact upon the ability to perform the GVT workout, so does the state of training that the athlete is in. Table 2 compares two groups of athletes' ability to perform the GVT workout, taken from the Baker and Newton study (1). Group 1 were professional athletes in the midst of a hypertrophy-oriented training block entailing the traditional edict of 6 – 7 exercises x 3 sets x 10 reps for their upper body workouts. Group two were semi-professional athletes who had just completed a low volume-load, high-intensity training block (4 – 6 exercises x 3 sets x 2-6 reps).

Clearly Group 2 could not cope with the upper body GVT workout as well as is evidenced by their more dramatic drop off in average training intensity per set across the 10 sets of the bench press portion of the workout. Basically, after the first four sets they had to reduce the training resistance continually in an attempt to maintain the performance of 10 repetitions per set. Group 1 maintained their ability to use the initial intensity far better. As such the GVT may be considered an advanced workout or a workout for athletes in a good state of muscle and cardiovascular conditioning.

## Conclusion

The GVT workout entails the performance of 10 sets of 10 reps at about 60% 1RM (or 20 RM) in 1 – 2 key exercises. This concentrated training dose appears fairly difficult for some athletes to perform. However, this type of workout is time effective, may be very stimulating or challenging for advanced athletes, and apart from the expected muscle fatigue / super-compensatory growth considerations, there appears to be a moderate cardiovascular training effect. ■

## References


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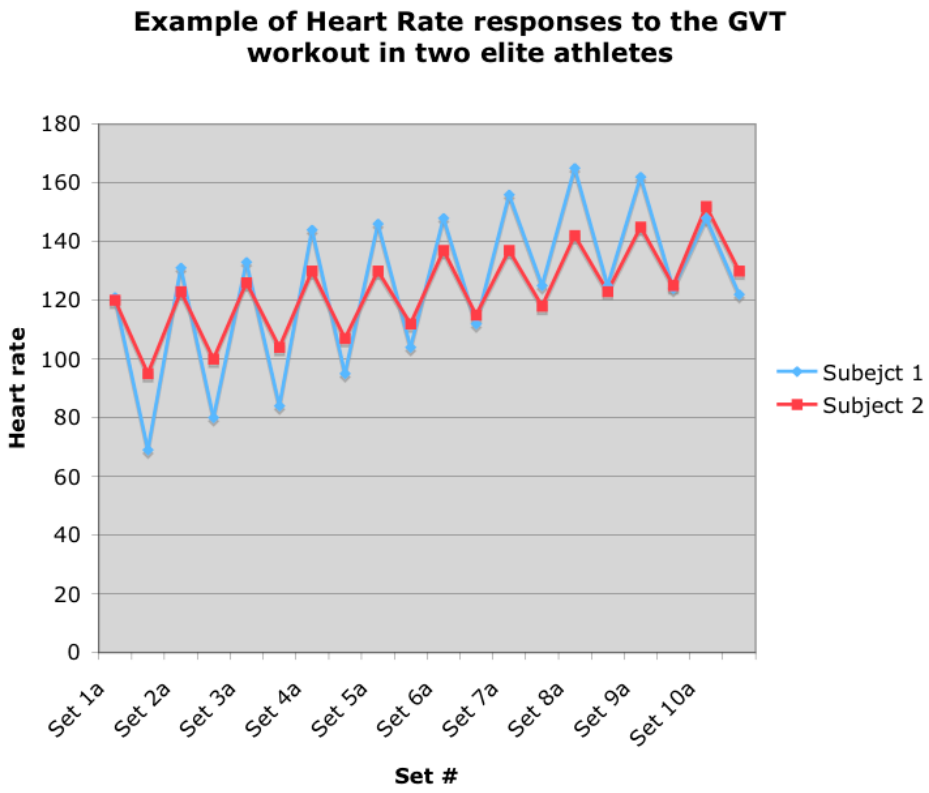


## Figure 1

A graphic display of the highest and lowest heart rate responses per 3-minute complex exhibited by two elite athletes to the GVT workout. The mounting HR stress is such that the lowest recovery HR during the latter sets is higher than the working HR response in the early sets.