

PROGRAM DESIGN CONSIDERATIONS FOR OPTIMAL STRENGTH AND HYPERTROPHY OF THE GLUTE MUSCLES

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Increasing glute strength can likely improve many performance-based actions, including sprinting, jumping, cutting, and rotating due to the glutes' triplanar role as hip extensors, hip abductors, and hip external rotators. While there is no best scientifically-proven way to periodize a program, there are many methods that a personal trainer can employ to successfully build stronger glutes in their clients. This article provides eight considerations when designing a program to optimally build the glutes.

1. EXERCISE SELECTION

Compound exercises such as squats, deadlifts, lunges, hip thrusts, and glute bridges can be used as staples in a glute training program because these exercises target multiple muscle groups, including the glutes, while allowing for heavier loads to be lifted, which can result in greater muscle growth. A study conducted by Santos et al. found that the addition of barbell hip thrusts to resistance training is effective in significantly increasing gluteus maximus muscle hypertrophy (10). This study compared the effects of performing 45-degree leg presses and stiff-leg deadlifts versus performing 45-degree leg presses, stiff-leg deadlifts, and barbell hip thrusts on gluteus maximus muscle size on 33 untrained young women (10). Over the 10-week training period, there was a notable difference in muscle size growth with the addition of the barbell hip thrust (10).

Different exercises load the glutes in different directions, which relates to body positioning and the ways in which the resistance is affecting it. Therefore, the author recommends to include the following types of glute exercises:

HORIZONTAL HIP EXTENSION EXERCISES

These movements will train the upper and lower subdivisions of the glute maximus in the shortened position, which is at the top when locked out (e.g., hip thrusts, frog pumps, back extensions, kickbacks, glute bridges). These exercises should not result in as much fatigue or soreness because they train the glutes at short muscle lengths (2).

VERTICAL HIP EXTENSION EXERCISES

These movements will train the lower subdivision of the glute maximus in the stretched position (e.g., squats, lunges, good mornings, deadlifts). These exercises typically create more overall fatigue and soreness because they involve a greater resistance challenge at long (i.e., stretched) muscle lengths. If these exercises were performed to failure, they would be more likely to cause excessive soreness, which can be counterproductive and result in a more difficult time recovering (5).

LATERAL/ROTARY GLUTE EXERCISES

Lateral/rotary glute exercises movements (e.g., lateral band walks, cable chop and lift variations, machine and band seated hip abduction) train the glute medius in the frontal and transverse plane while involving shorter muscle lengths. In other words, these exercises tend not to involve much of a stretch on the glutes because they work through a small range of motion and do not stress in the lengthened position. These movements are great for producing a burn, which provides metabolic stress. Thus, these exercises are less likely to cause overall fatigue and soreness.

The frontal plane will target the glute medius more while the transverse plane will also incorporate some glute maximus muscle fibers (3). In addition to incorporating exercises from all three categories, the author also recommends employing exercise variety and choosing exercises that suit the individual client's anatomy the best. Using the mind-muscle connection model, personal trainers should have their client think about the muscle that is being worked and experiment with different stances, ranges of motion, postures, and pelvic positions to determine which gives them the most glute activation (3).

PRACTICAL PROGRAM DESIGN FOR GLUTE DEVELOPMENT

The following four movement patterns are recommended to focus on during training session to maximize glute development (3):

- 1. Thrust/Bridge:** These are hip thrust, glute bridge, and frog pump patterns. These movements target the lower and upper glutes.
- 2. Squat/Lunge:** These are squat and split squat patterns along with step-ups and pistol squats. These movements target the lower glutes and quadriceps.
- 3. Hinge/Pull:** These are deadlift, back extension, and reverse hyperextension patterns. These movements target the lower glutes and hamstrings.
- 4. Abduction:** These include frontal and transverse plane hip abduction movements. These movements target the upper glutes.

One to two of these exercises should be unilateral.



FIGURE 1. MOVEMENTS PATTERNS FOR GLUTE DEVELOPMENT

2. PROGRESSIVE OVERLOAD AND MIND-MUSCLE CONNECTION

Progressive overload means gradual increase of training stress to drive adaptations on the muscles. Mind-muscle connection is defined as conscious and deliberate muscle contraction. One can increase their likelihood of getting stronger over time by incorporating progressive overload and focusing on the mind-muscle connection. A client needs both to maximize hypertrophy.

The following are some examples of what progressive overload can look like:

- Increasing resistance (load)
- Increasing repetitions at a given load
- Improving technique
- Adding volume/increase frequency (to a certain extent)
- Decreasing rest times
- Increasing range of motion

The following are some ways to implement better mind-muscle connection:

- Focus on training specific muscle group, not just lifting the weight
- Have the personal trainer or partner touch the target muscle
- Perform isolation (single-joint) exercises
- Tempo repetitions/slow down exercises performed
- Visualize target muscle(s) contracting

There are several studies and review articles demonstrating the effectiveness of mind-muscle connection in improving muscle activation during resistance training. The following are a few examples:

The article “Attentional Focus for Maximizing Muscle Development: The Mind-Muscle Connection” by Schoenfeld and Contreras discusses the concept of mind-muscle connection and its potential benefits for maximizing muscle development during resistance training (11). The authors explain that mind-muscle connection involves consciously focusing attention on the target muscle during an exercise, which can enhance muscle activation and potentially lead to greater muscle hypertrophy over time. The article provides practical recommendations for incorporating mind-muscle connection strategies into resistance training, such as visualizing the muscle contracting during an exercise and using verbal cues to enhance attentional focus. The authors also acknowledge that more research is needed to fully understand the mechanisms underlying mind-muscle connection and its effectiveness in promoting muscle development.

The article “Effects of Different Attentional Strategies on Electromyographic Activity During the Squat Exercise” by Calatayud et al. found that participants who were instructed to focus on their quadriceps muscles during a squat exercise had greater muscle activation in those muscles compared to those who were not given specific instructions on how to focus their attention (1).

The article “The Effect of an Attentional Focusing Strategy on Electromyographic Activity During the Flat Bench Press” by Schoenfeld et al. found that participants who were instructed to focus on the target muscle during a bench press exercise had higher electromyographic (EMG) activity in that muscle compared to those who were not given specific instructions on how to focus their attention during the exercise (7).

The article “Differential Effects of Attentional Focus Strategies during Long-Term Resistance Training” by Schoenfeld et al. concluded that mind-muscle connection can improve muscle activation and promote greater muscle hypertrophy during resistance training (14).

Overall, these studies suggest that incorporating mind-muscle connection strategies into resistance training can enhance muscle activation and promote greater gains in muscle strength and size.

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3. VOLUME AND FREQUENCY

The volume and frequency of training sessions will also play a role in building the glutes. As of now, the author is unaware of any research on volume and frequency of glute-specific training. Based on what is shown in the literature 10 – 25 sets per muscle group per week is ideal based on how the trainee recovers (13).

The author recommends to:

- Aim for at least three training sessions per week dedicated to glutes, and perform 12 sets of glute training per training session, which is 36 total sets of glutes per week. Again, this is highly individualized based on genetics and program design variables.
- Perform 12 sets of horizontal glute exercises, 12 sets of vertical glute exercises, and 12 sets of lateral/rotary glute exercises.
- Train glutes 2 – 6 times per week depending on program variables (e.g., volume, effort, exercise selection, etc.).

How much volume a client can handle heavily depends on genetics, exercise effort, gender, sleep, and stress management. Not only is there a huge genetic component to the amount of muscle damage a client experiences, but also to how efficiently the client recovers (3).

4. LOAD AND INTENSITY

Perform a blend of repetition ranges: high repetitions, medium repetitions, and low repetitions. Practically, this recommendation involves performing a third of the volume with high repetitions, a third with moderate repetitions, and a third with low repetitions, which yields the best overall muscle development. Research shows that muscle growth can occur in all repetition ranges as long as there is high exertion levels (12). Reaching actual failure is not necessary and can be counterproductive (12). It is not uncommon to see clients perform all of their sets where they are approaching failure week by week and can barely perform another repetition. This may lead to fatigue and stagnation in strength gains (8). Therefore, it is important to consider leaving a few repetitions in reserve and aim for progression week by week.

By programming glute training in the way previously described, the client will be more likely to train the glutes from every angle and joint action, thereby maximizing transfer to sport performance and functional activities; fully develop the upper and lower subdivisions of the gluteus maximus; and be able to tolerate higher workloads without accumulating excessive fatigue.

5. EXERCISE STRATEGY

If the goal is to build muscle, the personal trainer needs to make sure that their workouts contain the three major mechanisms that contribute to hypertrophy: mechanical tension, metabolic stress, and muscle damage (10). Mechanical tension is the primary driver of stimulating muscle growth and is created when a muscle contracts against a force (e.g., gravity) and increases the pulling forces on a muscle (10). Lifting progressively more weight over time creates more tension and increases the pulling

Glute Training: The Rule of THIRDS

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FIGURE 2. GLUTE TRAINING - RULE OF THIRDS

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forces on the muscle, thus increasing mechanical tension on the muscle over time. Metabolic stress is an increase in blood volume and metabolite production (12). The feeling experienced when getting a good “pump” or “burn” from an exercise as blood and metabolites rush into the muscle cell is the result of metabolic stress. Exercises like high repetition pump work, isolation exercises, and band work are effective at creating the highest degree of metabolic stress.

Muscle damage occurs when a muscle is placed under excessive stress, especially in a stretched position. During training, this primarily occurs in the eccentric (lowering) phase of an exercise. Muscle damage is a normal part of the training and recovery process as a muscle is placed under a stressor it is unaccustomed to. The immediate result (12 – 72 hr after the training) is soreness and inflammation, as well as decreased power, range of motion, and performance. After this acute reaction, if the muscle can recover properly, it will adapt and grow bigger and stronger. More research on muscle damage is warranted, but it is likely that it is the smallest contributing factor to muscle growth, though it still plays a role (10).

Muscles do not just respond to mechanical tension. Muscles respond to tension, metabolic stress, and damage. An ideal balance of these factors likely exists that maximizes hypertrophy; however, the optimal combination might differ between individuals.

6. TRAINING SPLITS

There are many ways a glute training program could be designed. Full body, upper/lower, body part split (e.g., quadriceps, hamstrings, glutes), or push/pull are all effective routines to follow if one abides by the programming recommendations provided in the previous sections (3). Any of these splits can be incorporated

as they include a combination of training concepts that take advantage of making the most gains and being able optimally recover. Full body training involves performing the four primary glute patterns on each training day (thrust/bridge variations, squat/lunge variations, deadlift/hinge variations, and abductions variations). A bodypart split is a popular way to train and allows lower body training three times per week instead of the typical once per week. A personal trainer can set up the split with a quadriceps day, a hamstring day, and a glute day. Using the upper/lower split training, the personal trainer could set up the split like this example: Day 1 – squat variation, hinge variation, single-leg hip thrust variation, and abduction variation; Day 2 – hip thrust variation, lunge variation, hinge variation, and abduction variation; Day 3 – deadlift variation, squat variation, hip thrust variation, and abduction variation.

7. REST TIME

The author recommends approximately 2 – 3 min of rest between sets in general, 3 – 6 min of rest between sets when going for personal records on compound lifts, and 60 – 90 s for isolation exercises (6). Appropriate rest helps ensure adequate effort, volume, and load without wasting too much time.

8. REST AND RECOVERY

Finally, make sure to give the client's body enough time to rest and recover between training sessions. This can help reduce injury due to overtraining, reduce muscle soreness, and allow muscles to repair and grow. The client will only benefit from the training that they can effectively recover from. Insufficient recovery could be due to poor nutrition, poor sleep, training too much, or combining training with opposing goals (e.g., too much cardio when the goal is strength). Not only is recovery a part of programming, nutrition, sleep, and stress management are also important to optimize progress.

CONCLUSION

In the pursuit of powerful and functional glutes, program design is paramount to optimal strength and hypertrophy. As a personal trainer delves into the intricacies of sculpting powerful glutes, it is important to remember that it is not a one-size-fits-all journey. Designing a program depends on many factors, such as individual differences and training goals. Experimentation is needed to modify the program to suit the individual client.

There are many ways to make an effective glute building program when it comes to periodizing the program design variables. Using evidence-based information, personal trainers may want to start with training the muscle group at least two times per week and start with roughly about 10 sets (depending on how the individual recovers). The rule of thirds ensures that the strength and physique training program is productive, balanced, and efficient while providing structure for the program design principles and exercise selection by considering vector, load, and effort along with taking into consideration the levels of mechanical tension, metabolic stress, and muscle damage for the upper and lower glute max subdivisions.

Personal trainers are encouraged to make sure clients are performing the four main movement patterns, which includes all three categories (horizontal hip extension exercises, vertical hip extension exercises, and lateral/rotary glute exercises), to round out glute development. Due to individual differences in anatomy, there is no list of best glute exercises that fits everyone. Personal trainers should employ exercise variety and choose exercises that suit the client's anatomy. There are numerous exercise variations for each pattern. Clients may not always like every exercise, but a personal trainer can find an exercise within each category that suits their body well. For example, one client might like barbell hip thrusts, back squats, conventional deadlifts, and machine seated hip abduction, whereas another might prefer hip-banded hip thrusts, reverse lunges, single-leg Romanian deadlifts (RDLs), and lateral band walks. There is an art and science to creating the best glute training program while factoring in all the program design variables, client's training goals, fitness level, lifestyle, age, and genetics.

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