

Considerations for Optimizing Your Program

By: Frankie Vincent, November 2019

It's likely programming with respect to exercise selection and rep range is a mix between art and science. Obviously the programmer uses specific exercises and rep ranges focused on specific goals yet there are many variables in play. Considerations for exercise selection and rep range with respect to resistance training is multifactorial i.e. there are various aspects to consider e.g. physiological demands of sport or activity, appropriate stress needed, one's training history, goals, barriers, and resources come to mind.

Considerable confusion still exists in the sports medicine literature concerning the measurement of muscular power and what it represents. Measures of muscular performance cannot be conveniently categorized as "strength " or "power" on the basis of the contractile velocity employed in the performance task.

Definitions that are likely beneficial to “know” or clear up with respect to physical activity and/or resistance training -

Strength - ability to produce force against a specific external resistance (force output)

Power - work/time i.e. is the rate at which work is done (or energy is transferred).

Hypertrophy- An increase in cell size (girth), usually in reference to fat or muscle cells.

Muscular endurance- The ability of the muscle to perform repetitive contractions over a prolonged period of time.

Muscular strength- The ability of the muscle to generate the maximum amount of force.

Muscle fibers- Individual muscle cells that are the functional components of muscles.

Rate of Force Production - the capacity to produce maximal voluntary activation in the early phase of an explosive contraction (first 50–75 ms), particularly as a result of increased motor unit discharge rate (Maffiuletti et al, 2016)

Nervous system - the network of nerve cells and fibers which transmits nerve impulses between parts of the body.

Muscle Cross Sectional Area - is the area of the cross section of a muscle perpendicular to its fibers, generally at its largest point.

Physiological demands - the physical demands of the sport or activity e.g. energy requirements.

Motor Unit Recruitment - refers to the activation of additional motor units to accomplish an increase in contractile strength in a muscle.

There are many studies inspecting various rep ranges with respect to muscle hypertrophy. Major health organizations such as the American College of Sports Medicine have recommended a multitude of loading and volume strategies in a periodized manner for advanced hypertrophy training, the moderate-to-high intensity range (6–12 RM) has been regarded as an effective hypertrophy training zone that thought to provide a sufficient balance of mechanical and metabolic stress to the trainee (Ratamess et al. [2009](#)). Issues for this blanket rep range are that it doesn't consider the aforementioned.

Back to aforementioned considerations:

Physiological demands - Aerobic/Anaerobic (energy requirements): Does the sport require continuous, sustained activity, short bursts of intense activity, or a combination of both?

Examples: Distance running is high aerobic, low to moderate anaerobic.

Javelin throwing is high anaerobic, low aerobic. Soccer (position dependent) is likely high for both. Archery is low for both. Tennis favors moderate to high

anaerobic. This position proves more true the higher level the match is played at. This concerns how intense activities are, how long they last, and how much recovery time is needed in between bouts of activity.

One's **training history** - How long and how prepared is the trainee with respect to resistance training and/or conditioning? How sensitive is the person to given exercise and/or intensity? How much or less stress is needed to drive adaptation?

Goals - What are the trainees goals? This should likely be in line with the physiological demands of the sport or activity.

Barriers - What is a challenge for the trainee to begin? Said differently, how do we increase one's compliance to said program? Time, scheduling, financial resources, injury limitations come to mind. Practicing motivational interviewing has the most supportive evidence with respect to behavioral change.

Resources - What training resources does the trainee have? Are they a professional athlete? If so, most of their training should be done practicing their sport. What equipment do they have access to? Are there any injuries or physiological and/or psychological barriers?

Rate of force production refers to the ability of the neuromuscular system to increase contractile force from a *low or resting level* when muscle activation is performed as quickly as possible, and it is considered an important muscle strength parameter, especially for athletes in sports requiring high-speed actions (Agaarad et al, 2018). In light of this, when programming, exercise selection may be important for many sports e.g. sprinting, tennis, and others that rely on muscle activation as quickly as possible.

As a means of maintaining the health of the musculoskeletal system throughout the lifespan, the American College of Sports Medicine (ACSM) recommends that adults participate in resistance training at least twice per week. However, Kruger and colleagues highlight that **only 20% of women were resistance training** two or more times per week, and this percentage is lower than the goal of 24% targeted in Healthy People 2020.

Dose dependent, frequency, and exertion level (RPE) are likely factors to be considered as well.

“Marked increases in strength and endurance can be attained by resistance-trained individuals with just three 13-min weekly sessions over an 8-wk period, and these gains are similar to that achieved with a substantially greater time commitment. Alternatively, muscle hypertrophy follows a dose–response relationship, with increasingly greater gains achieved with higher training volumes” [BRAD J. SCHOENFELD](#) et al, 2019.

Various meta-analysis show a dose–response relationship between the total number of weekly sets and increases in muscle growth (Krieger et al 2017). Said differently, the more appropriate stress that is implied the better results.

Alternatively, you can email me if you have identified a particular interest like losing weight fast, building muscle, or sport specific training etc. - or you may pursue a different training approach entirely.

So if you choose to pursue one of my training protocols, I'm confident you'll enjoy it.

Happy Training,
Frankie

Resources: For individual inquires please email - Frankiefcms@gmail.com

[Getting Started](https://www.coastalmuaythai.com/post/getting-started) - <https://www.coastalmuaythai.com/post/getting-started>

[Squat Guide](https://www.coastalmuaythai.com/squat101) - <https://www.coastalmuaythai.com/squat101>

[Nutrition: Considerations for Successfully Optimizing Your Diet](https://www.coastalmuaythai.com/post/nutrition-successfully-optimizing-your-diet-template) -

<https://www.coastalmuaythai.com/post/nutrition-successfully-optimizing-your-diet-template>

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