



Accommodating Resistance

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Identify the Problem

Perform Integrated Assessments

- Static
- Dynamic
- Transitional
- Mobility



Solve the Problem

Design Phases of the Corrective

- Exercise Continuum
- Inhibit
 - Activate
 - Lengthen
 - Integrate



Implement the Solution

Coach Selected Techniques

- in Workouts and Movement
Prep Sequences

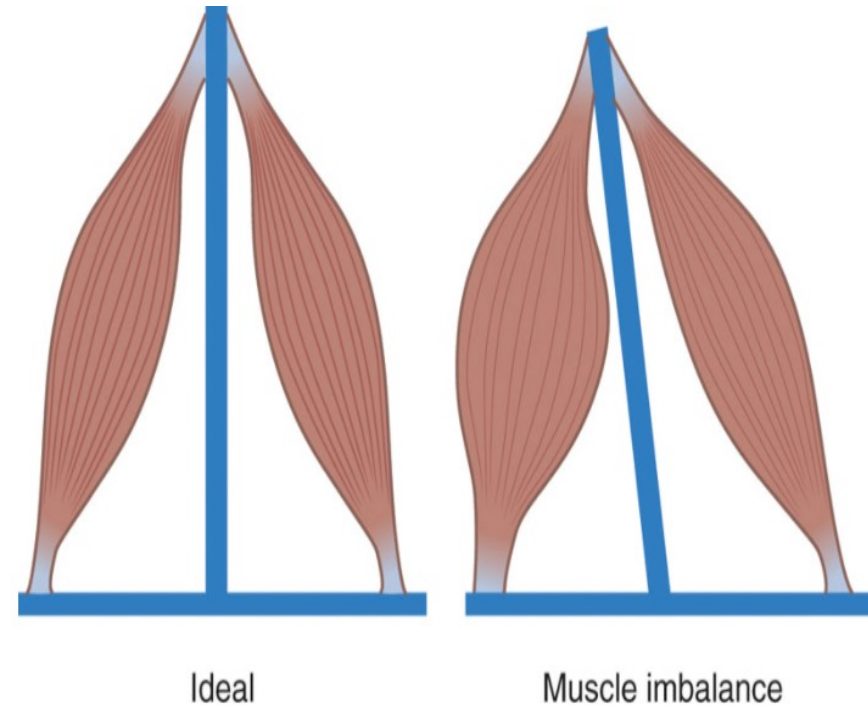
Introduction

- Discuss the functional anatomy of muscles in their shortened positions.
- Discuss the importance of training in the end ranges of motion.
- Discuss training implements such as bands and chains and how they help strengthen muscles in the end ROM.
- Discuss how these new training techniques can be implemented with the OPT Model.



Resting Length

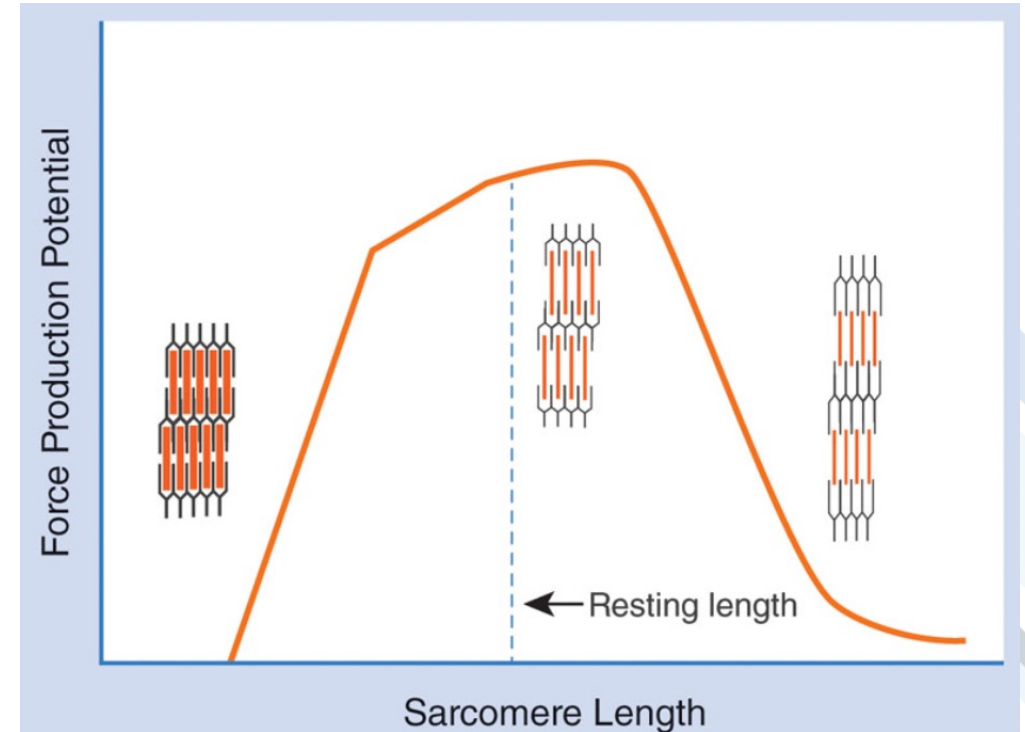
The length of a muscle when it is not actively contracting or being stretched.



Accommodating Resistance

Length Tension Relationship

A **length-tension relationship** refers to the association between the **resting length** of a muscle and the amount of internal tension it can produce at that resting length (Levangie et al., 2019).

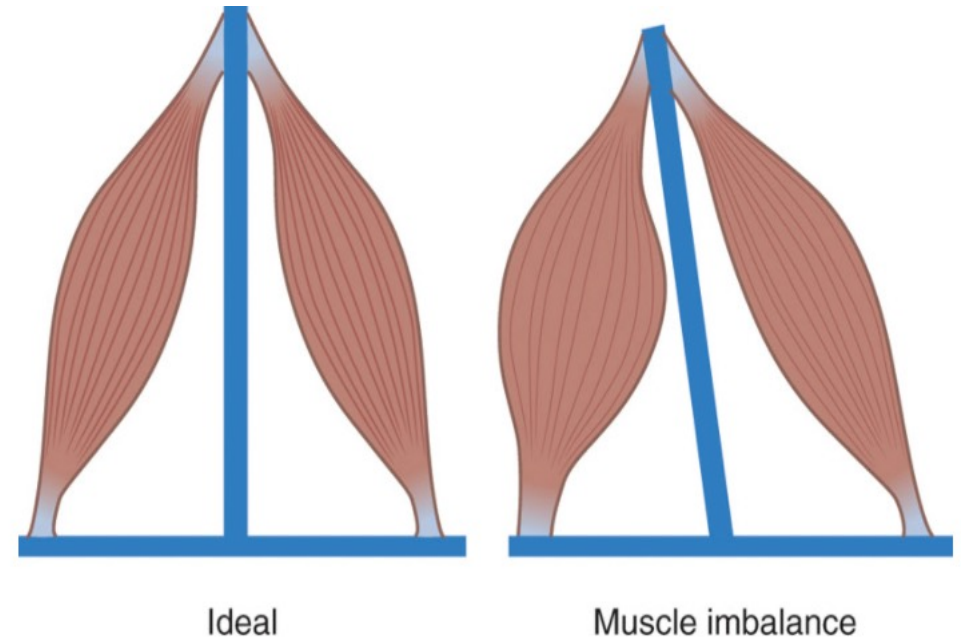


Muscle Length

Overactive (forcing compensation to occur) and others may be **underactive** (allowing for the compensation to occur)

Overactive when elevated neural drive causes a muscle to be held in a chronic state of contraction.

Underactive when a muscle is experiencing neural inhibition and limited neuromuscular recruitment

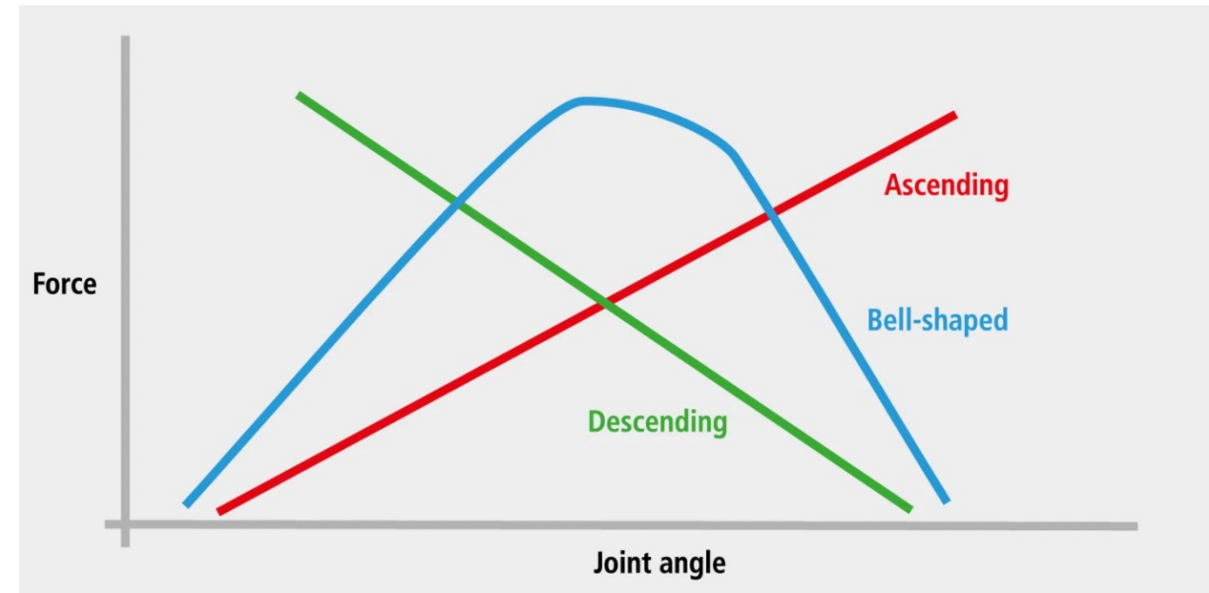


Strength Curves

Exercises with an ascending strength curve are those easiest at top, where there musculo-skeletal system gains a mechanical advantage closer to extension eg. Bench press / squat / deadlift

In a descending strength profile, exercises are hardest at the top range of motion while maximum strength is produced at the start of a lift eg. Pull ups and chin ups (As you begin to struggle to get your chin to the bar at end range during fatigue, this is the descending curve working against you)

Single joint exercises have more of a bell-shaped curve where maximum strength occurs around the middle of the lift (arm curls, leg/ tricep extension).



OPT Model and the Force Velocity Curve

Accommodating resistance is utilized for its ability to fit exercises to strength curve of a movement.

For example, if an individual has a maximal lift of 300lbs, it means that at the weakest point of the movement the individual could lift 300lbs.

So, in essence a one rep max is a representation of the maximal strength of an individual's weakest position.



Accommodating Resistance

In theory any point at which are not considered sticking points may actually not be having to produce maximal amounts of force / muscular contraction, therefore creating less than optimal training effects.



Injury Prevention

Accommodating resistance can also be used to work around injuries as it allows a resistance profile that takes out the stress of the inertia at the beginning of traditional isotonic exercises.

Accommodating resistance allows the load at vulnerable ranges of motion to be minimized.



Exercise Examples



Benefits

- Bands and chains in combination with barbell loading seem to involve **increased power outputs** in comparison to barbell loads equated at the top of the movement. This may provide the ability to train power concurrently with strength.
- Bands and chains in combination with barbell loading seem to **involve increased EMG activity** in comparison with isoinertial exercises. This may provide a greater hypertrophy stimulus for the same workload. However, whether this is really the case requires future research.
- Bands and chains in combination with barbell loading seem to lead to **similar or greater increases in strength** and **greater increases in Rate of Force Development** in variable resistance-trained subjects in comparison with isoinertial training in the same movements.
- Additional benefits of rubber band-resisted and weighted-chain training may include lower joint soreness, as a result of reduced loading in the bottom position.

Key Takeaways

- Do you have a good understanding of Accommodating Resistance / Strength Curves?
- Progressions and regressions are key!
- Accommodating resistance can be used in all Phases of the OPT Model.



Open Q&A



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