

# Force Velocity Profiling



Tim Caron

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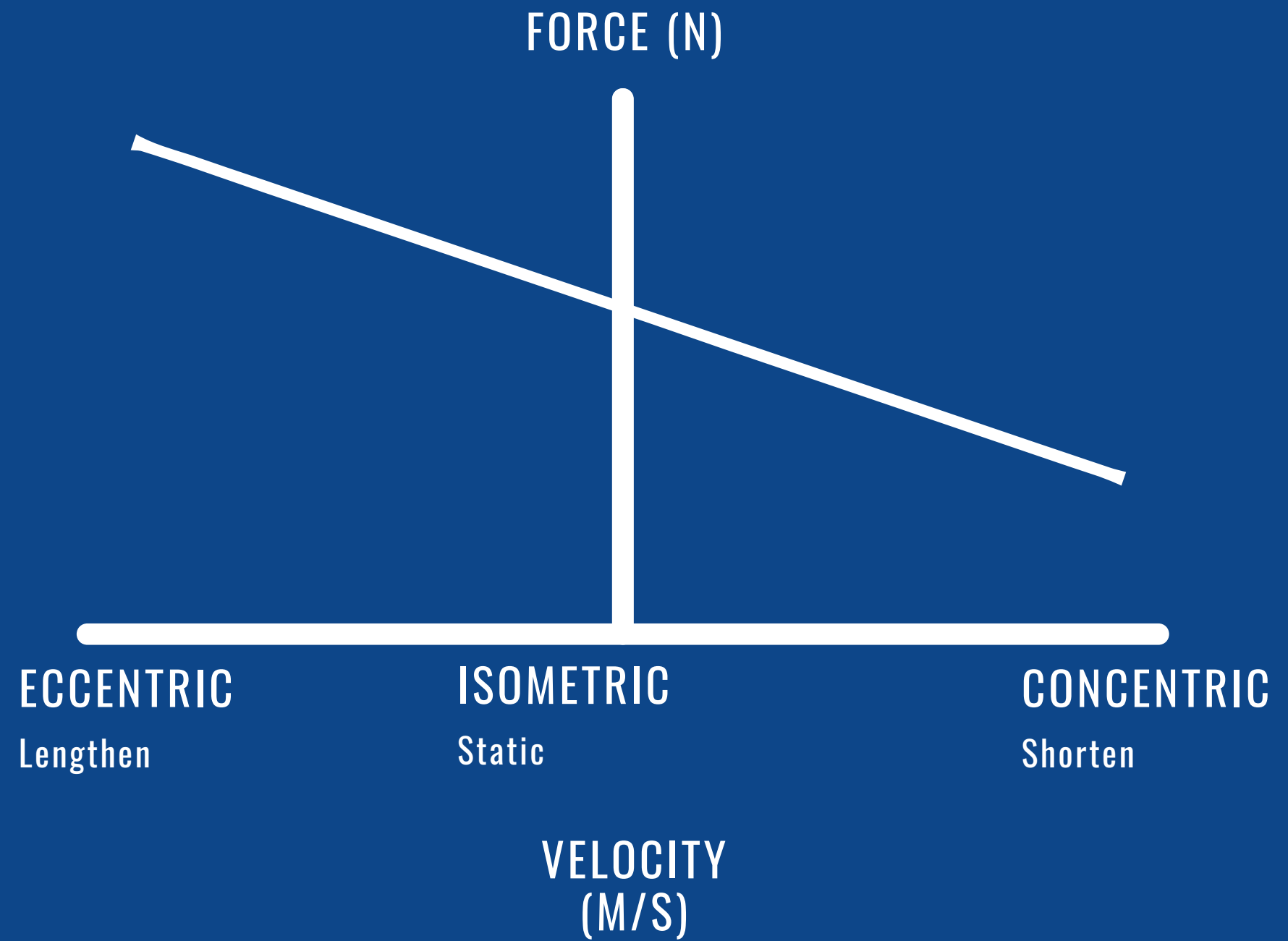
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# Contraction Type Force Velocity Curve



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# Qualities

**POWER**

TUT <10sec  
RM% 40-80

**RELATIVE  
STRENGTH**

TUT <20sec  
RM% 85-100

**FUNCTIONAL  
HYPERTROPHY**

TUT 20-40 sec  
RM% 70-85

**HYPERTROPHY**

TUT 40-70sec  
RM% 60-75

**MUSCULAR  
ENDURANCE**

TUT >70sec  
RM% 40-60

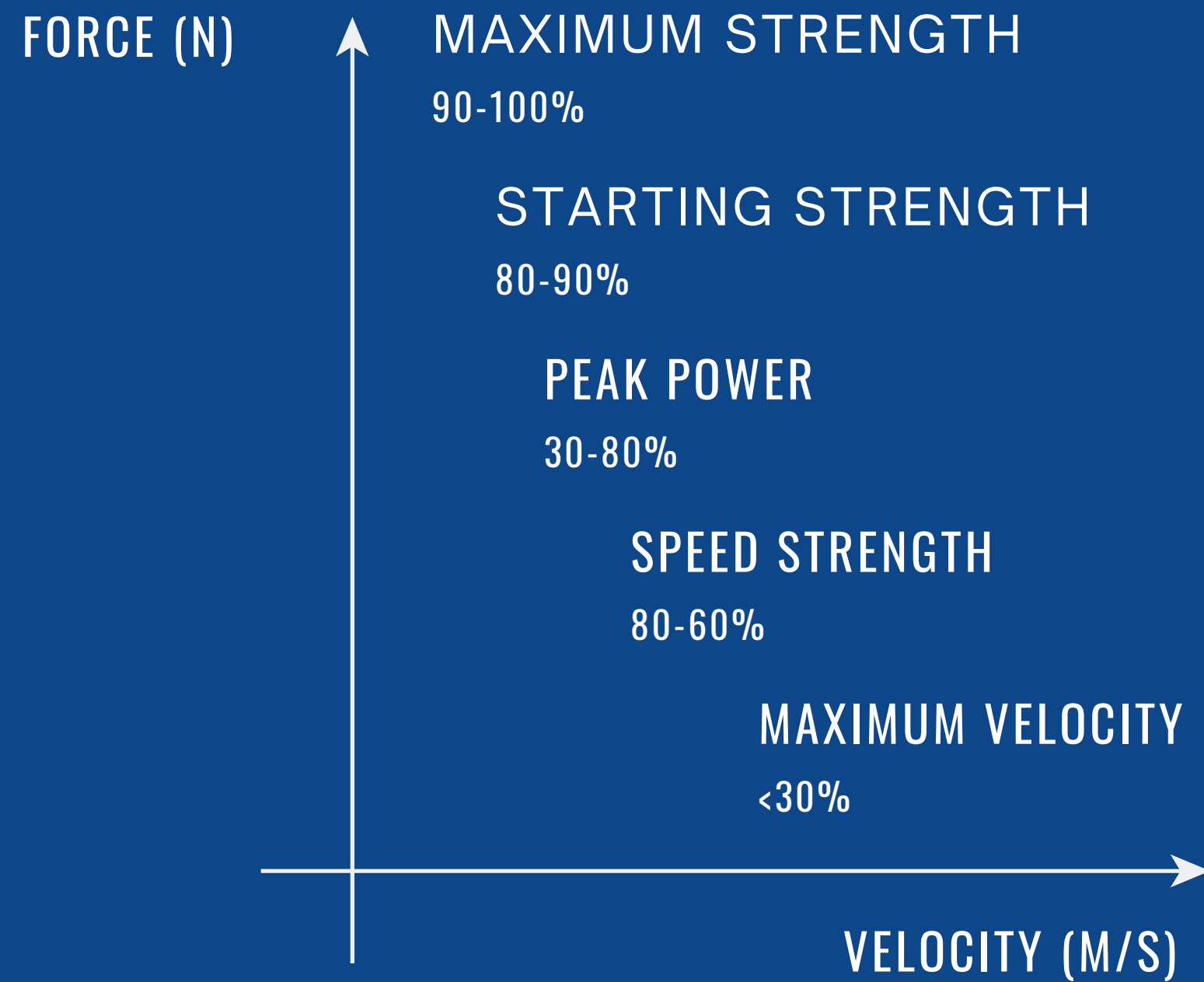


**Velocity**

**Force**

**Work**

# Force Velocity Curve



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# Velocity Zones



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# Force Velocity Profile



# Force Velocity Rx

**CLEAN**  
100%

**SNATCH**  
<85%

**GET STRONGER**  
Force Focus

**CLEAN**  
100%

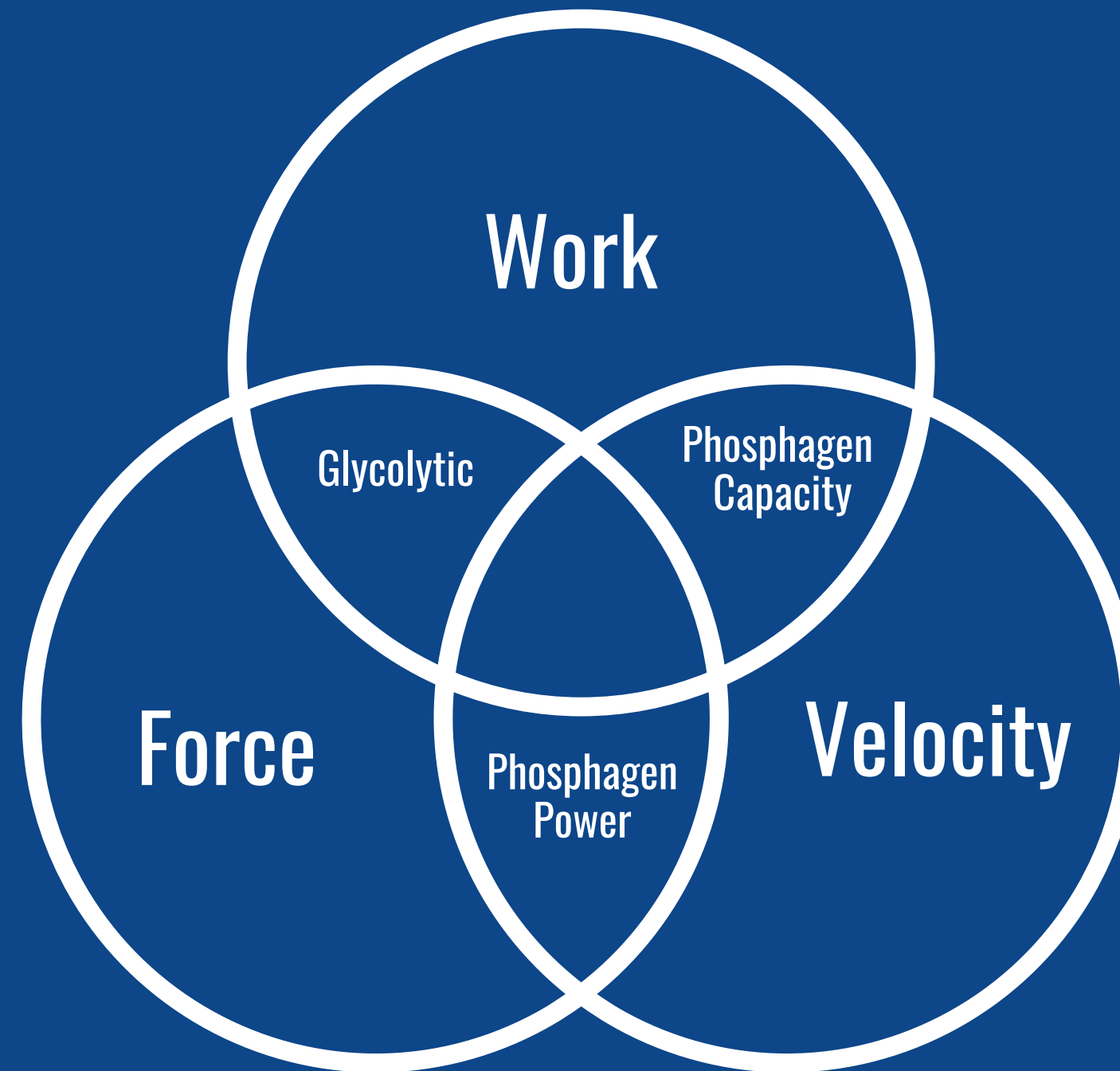
**SNATCH**  
>85%

**GET FASTER**  
Velocity Focus





# Force Velocity Convergence



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# Training Session 1

## Linear Speed

### Dynamic WU

A1 Flywheel Zercher Squat 5x10

A2 Mini Hurdle Jumps (Extensive) 5x10

Rest 2min

B1 Flywheel Handle 1/4 Split Squat 5x10E

B2 Mini Hurdle Linear Hops 5x5E

Rest 2min

C1 Half Kneeling Starts (5 Hard) 5x5E

Rest 1min

D1 Flywheel Handle Contra Lunge 5x5E

D2 10yard Accel to 5yard Decel x5

Rest 2min

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# Practical Applications of Testing



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# Dynamic Correspondence

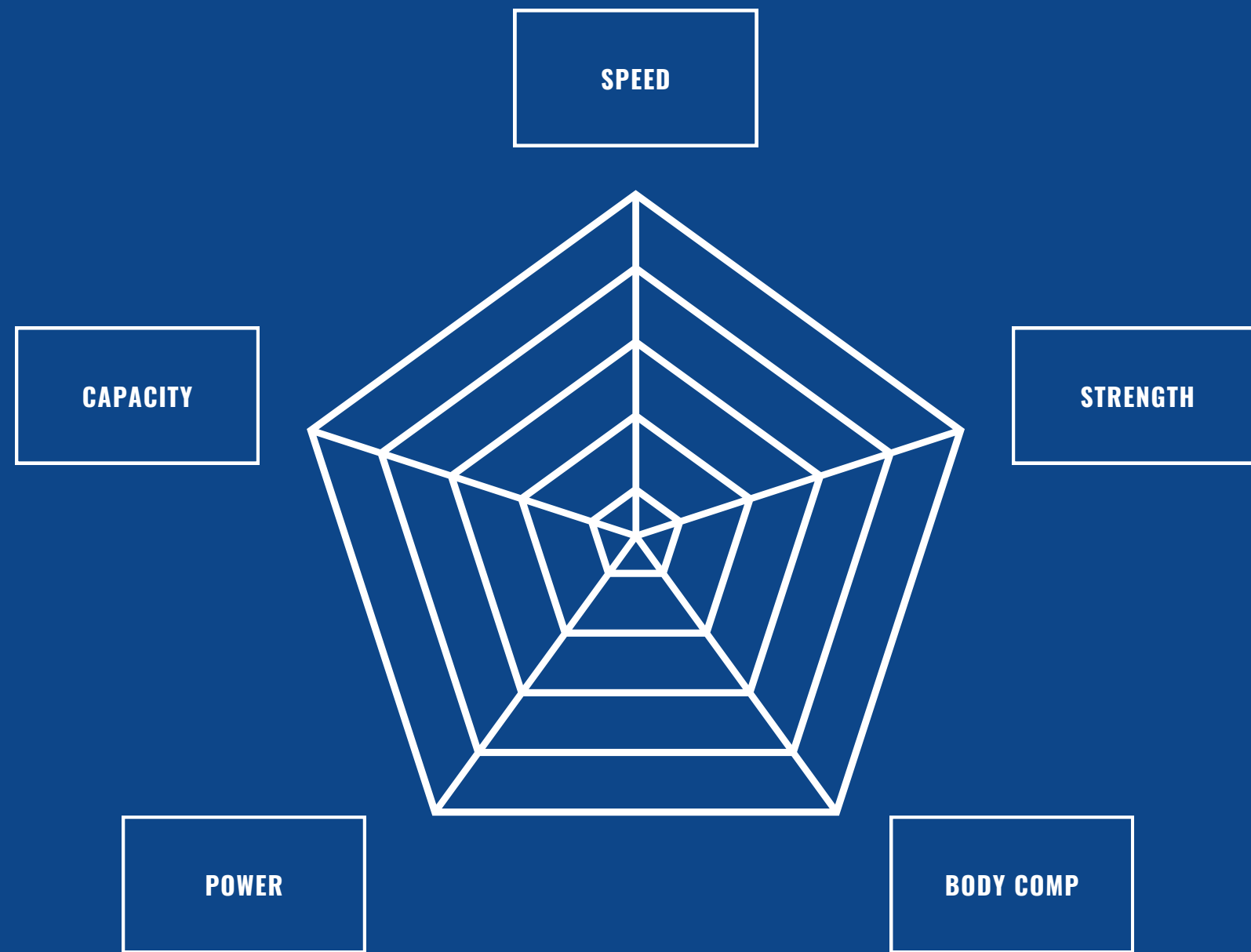
If it does not apply, why?

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# Athletic Profile



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# KPI

## Correspondence > Attributes

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# Intensity

Velocity is correlated to  
Inertia, which makes it a  
better proxy for intensity

S.A. McErlain-Naylor and M. Beato

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# Interchangeable Force Velocity

Low Inertia - Velocity Deficit  
High Inertia - Force Deficit

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# Intensity

High inertia creates higher eccentric force.

Low inertia creates higher eccentric velocity.

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# Volume

Greater distance from center of rotation increases inertia.

Higher inertia is associated with higher work.

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# Volume

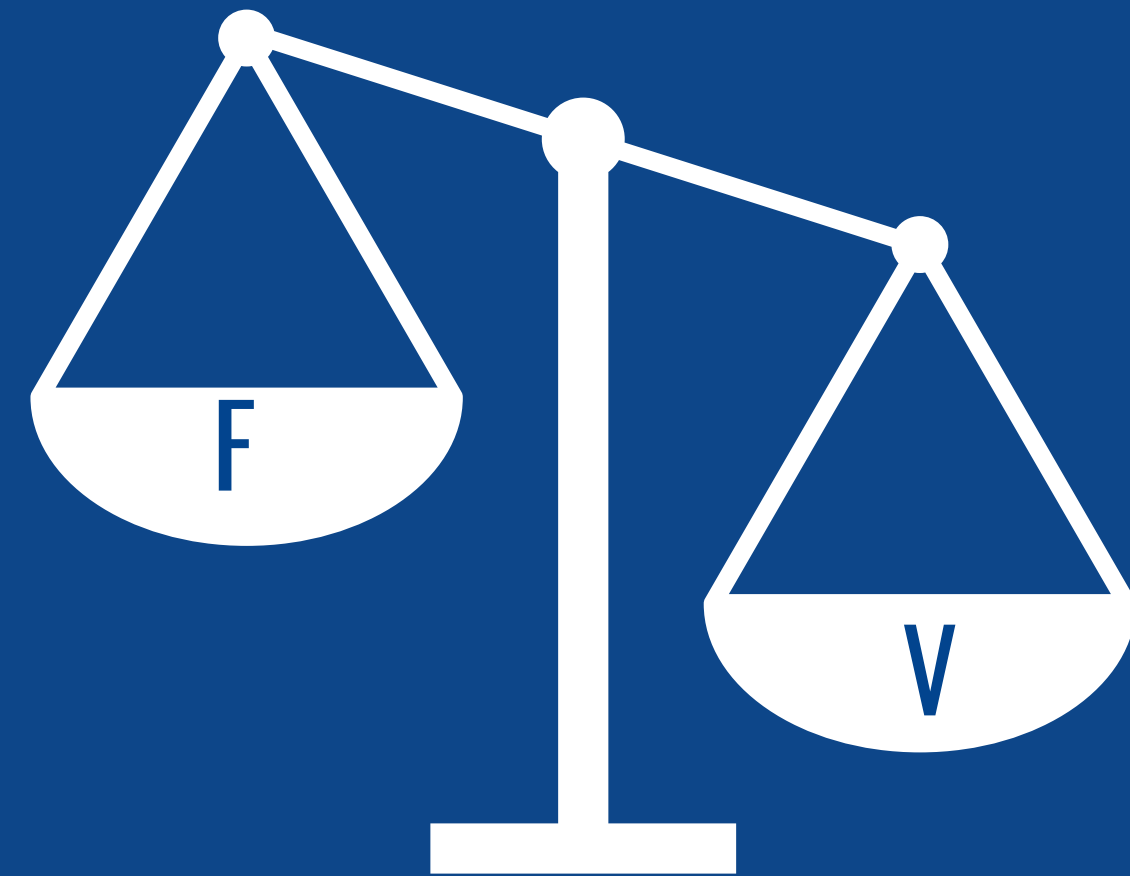
Dictated by:

- increase the distance per rep
- increase the number of reps
- increase the duration of reps
- Combine distance, reps, duration

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# Force Velocity



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# Training Session 2

## Multi Directional Speed

Dynamic WU

A1 Rotational Row 5x10E

A2 Rotational Jumps (Extensive) 5x10yard

Rest 2min

B1 Flywheel Handle 1/4 Split RDL 5x10E

B2 Lateral Bound (Traveling) 5x5E

Rest 2min

C1 5yard Shuffle to 10 Yard Sprint (Open Step) 5x5E

Rest 1min

D1 Flywheel Rope Rotational Lift 5x5E

D2 Cross Over Start to 5yard Stop x5E

Rest 2min

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# Multi Planar/Multi-Vector Approach



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# Dynamic Correspondence

Break the 'plane'

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# SPP



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# Trainable vs Training

Training is not exclusive exercises that we can progressive overload with intensity, volume, or density.

## Training

- Patterns are based on progressive overload.

## Trainable

- Locomotion are skills we develop competency within training.

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# Actions

Concentric - Propulsion  
Eccentric - Loading

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# Gravity Based

Limited by concentric-propulsion ability

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# Gravity Based

Resistance is greatest  
perpendicular to gravity

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# Flyhweel

Constant resistance

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# Flyhweel

## Inertia Based

- Angular velocity
- Propulsive force dictates loading forces

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# Trainable

Walk, Skip, Shuffle, Carioca, Run

Jump, Hop, Bound, Jop, Hump

Toss, Throw

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# Training

## Lower Body

- Squat
- Hinge

## Upper Body

- Push
- Pull

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# Planes & Vectors

## Planes

- Sagittal
- Frontal
- Transverse

## Vectors

- Vertical
- Horizontal
- Rotational

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# Stance/Driver

## Lower Body

- Bilateral
- Unilateral
- Asymmetrical

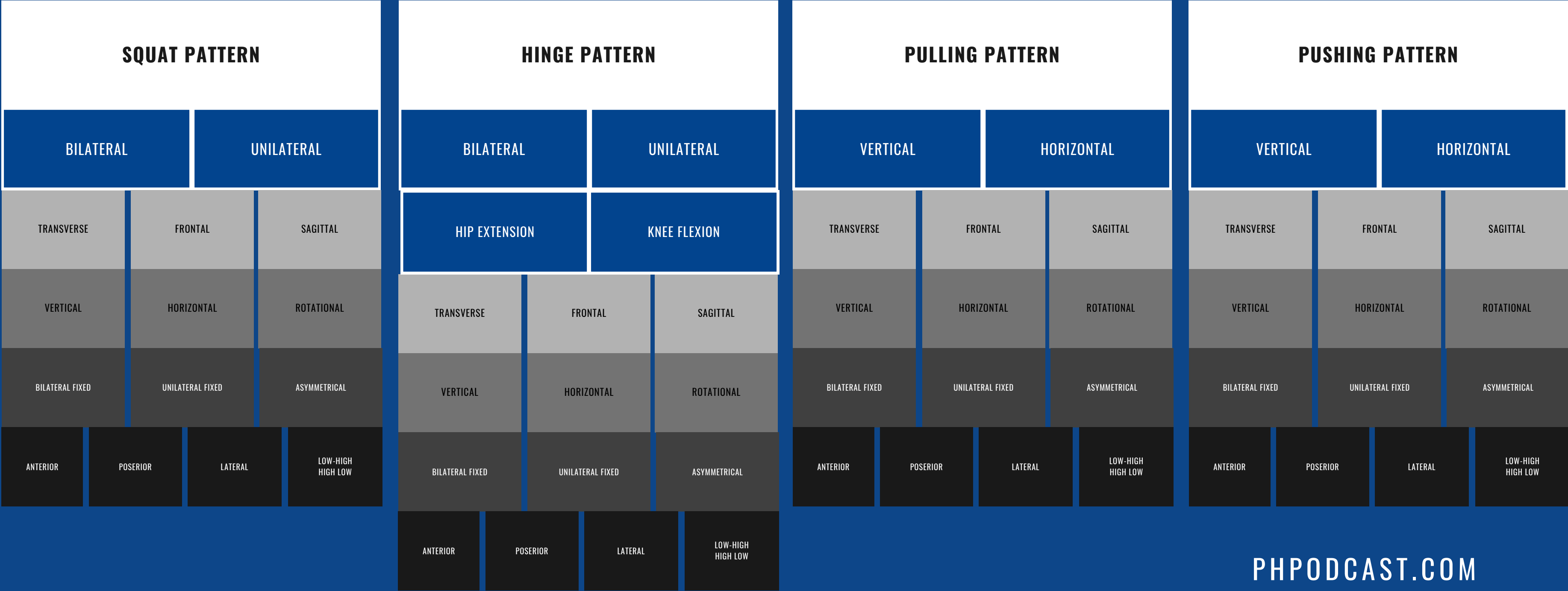
## Upper Body

- Anterior
- Posterior
- Lateral
- High-Low/Low-High

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# Patterns



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# When to insert

When gravity based  
resistance does not make  
sense relative to the  
correspondence

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# Training Session 3

## Mixed Method Upper

A1 Low Incline Bench (Keiser) (XOXO) 1.3m/s 10x3

A2 Flywheel Seated Row (XOXO) >1m/s 10x10

Rest 2min

B1 Flywheel Pulldown (XOXO) >1m/s 6x10

B2 Neutral Grip Pullup (4OXO) .3m/s 6, 4, 2, 6, 4, 2

Rest 2min

C1 Keiser Pec Fly (2OXO) >1m/s 3x20

C2 Push Up Drop Set (3 Drops) 3xFailure

Rest 1min

D1 Flywheel Bicep Curl 3x10

D2 Keiser Pushdown Drop Set (3 Drops) 3xFailure

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# Contraction Type Approach



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# Contractions

## Eccentric

- moving away from origin

## Concentric

- moving towards origin

## Isometric

- static contraction
  - yielding - preventing moving from origin
  - overcoming - attempting to move towards origin

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# Motion

## Propulsion

- moving forward

## Loading

- preventing moving forward

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# Push vs Pull Types

Push

- Long to Short

Pull

- Short to Long

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# Wide vs Narrows

**Wides**

- Eccentric to Concentric

**Narrow**

- Concentric to Eccentric

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# Strength Deficit

Eccentric to Concentric  
Strength

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# Strength Deficit

Naturally stronger eccentric  
till we introduce strength  
training

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# Strength Deficit

Reversing the effect of  
strength training

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# Flywheel

## Overload Eccentric

- Linear relationship between propulsion and loading

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# Flywheel

## Delayed Eccentric

- Momentum from angular velocity continues propulsion wise into loading

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# Flywheel

Force

- Larger wheel

Velocity

- Smaller wheel

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# Connical

More consistent between  
propulsion and loading

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# When

Forward

- Fix Deficit

Backward

- Change Deficit

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# When

## Deficit

- CMJ > NCMJ
  - Propulsion Focus
- NCMJ > CMJ
  - Loading

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# When

## Deficit

- CMJ > NCMJ
  - Propulsion Focus
- NCMJ > CMJ
  - Loading

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