



How to Apply  
**THE NEW SCIENCE  
OF SPEED TRAINING**  
To Your Athletes  
and Clients

**PARISI**

*The New Science of Speed Training*

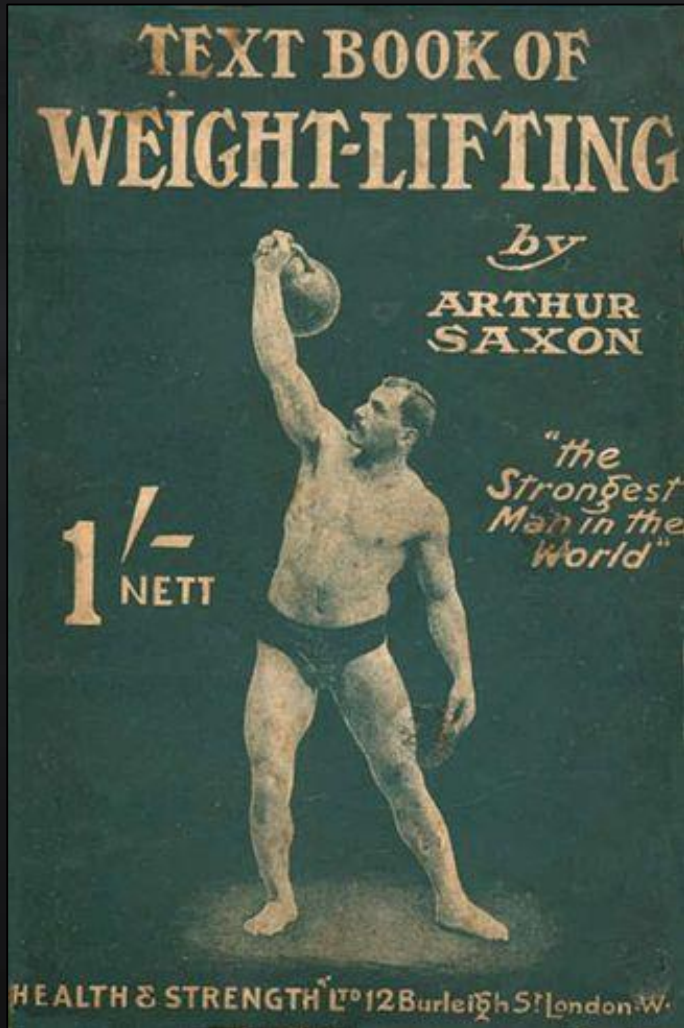
OPTIMIZING  
INDIVIDUAL  
FORCE  
SIGNATURE

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# TRADITIONAL STRENGTH TRAINING





# TRADITIONAL RESISTANCE TRAINING



**ISOTONIC**



**ISOMETRIC**



**ISOKINETIC**



**VARIABLE RESISTANCE**



**PARISI**



ISOTONIC  
RESISTANCE

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**PARISI**



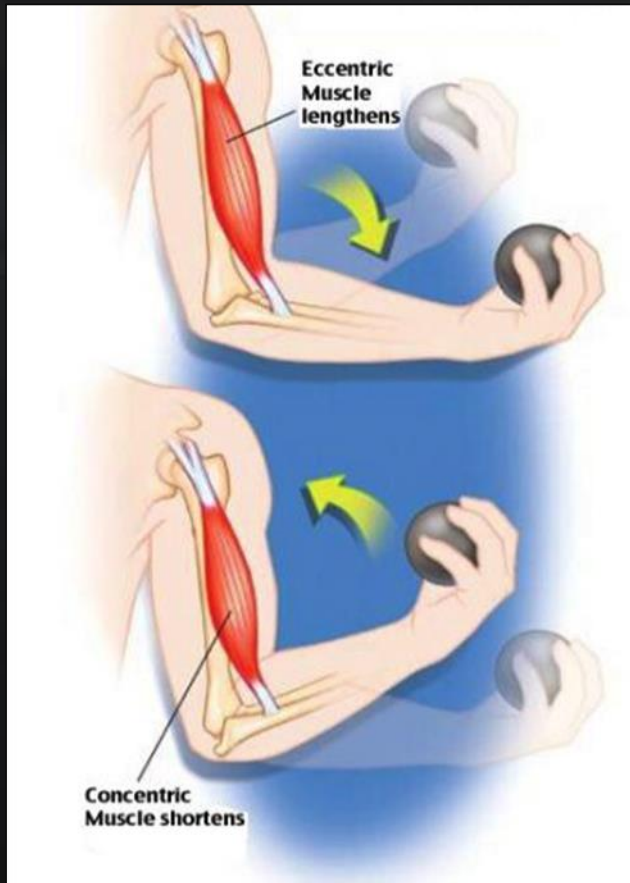
# ISOMETRIC RESISTANCE

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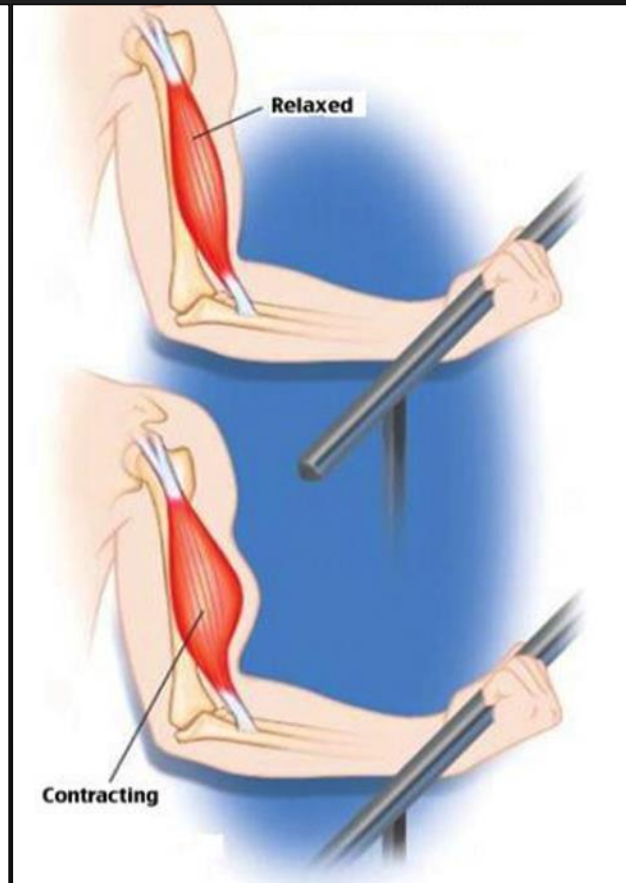
**ISOTONIC**

**Same Tension;  
Changing Length**



**ISOMETRIC**

**Same Length;  
Changing Tension**



**FUNCTIONAL**

**VS.**

**NON-FUNCTIONAL**

**ECCENTRICS**

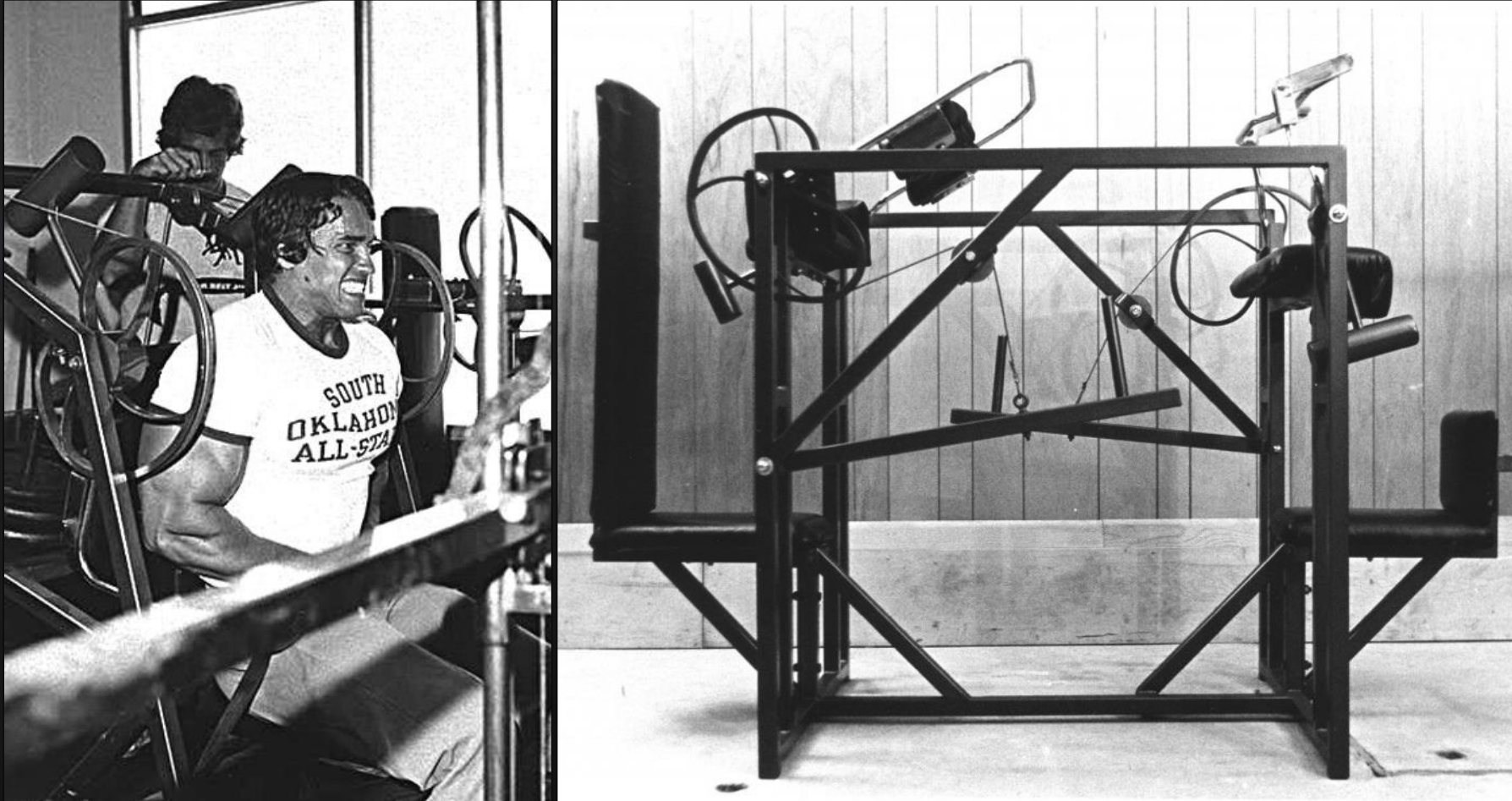
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**PARISI**

# THE NAUTILUS CAM

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*History of  
Variable  
Resistance  
Training*



**PARISI**



MODERN  
VARIABLE  
RESISTANCE  
TRAINING

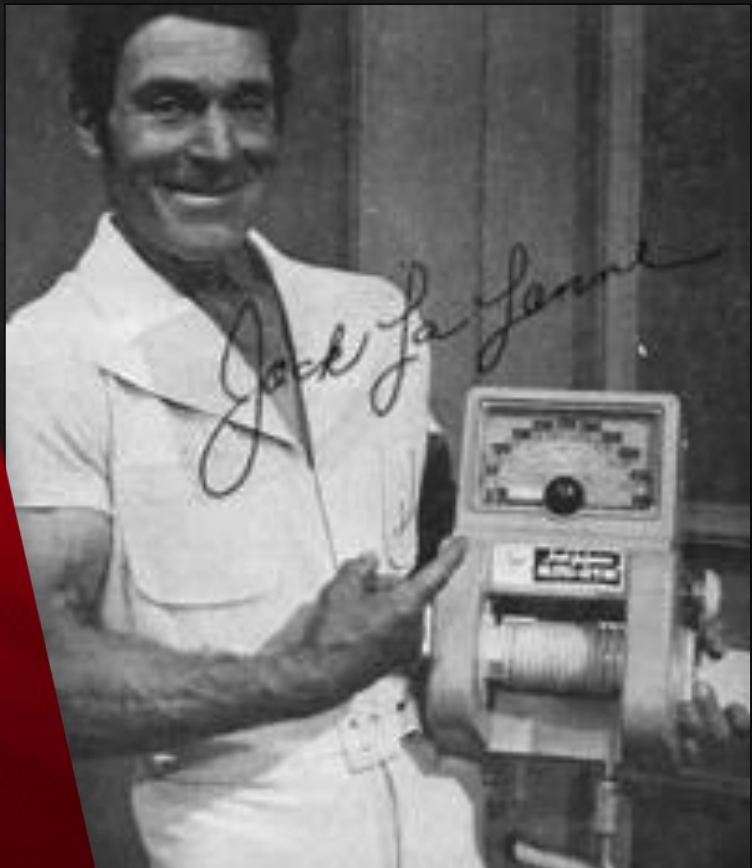
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*Elastic +  
Free Weights*



# THE HISTORY OF ISOKINETIC TRAINING

**JACK LALANNE &  
MINI GYM '73**



**1<sup>st</sup> LEAPER 1974**



*The world's  
first speed  
controlled  
exerciser had  
no resistance  
setting*



**PARISI**



MY  
HISTORY  
WITH  
ISOKINETIC  
TRAINING

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**PARISI**

# ISOKINETIC TRAINING BECOMES POPULAR

**1<sup>st</sup> ISOKINETIC MINI GYM 1967**





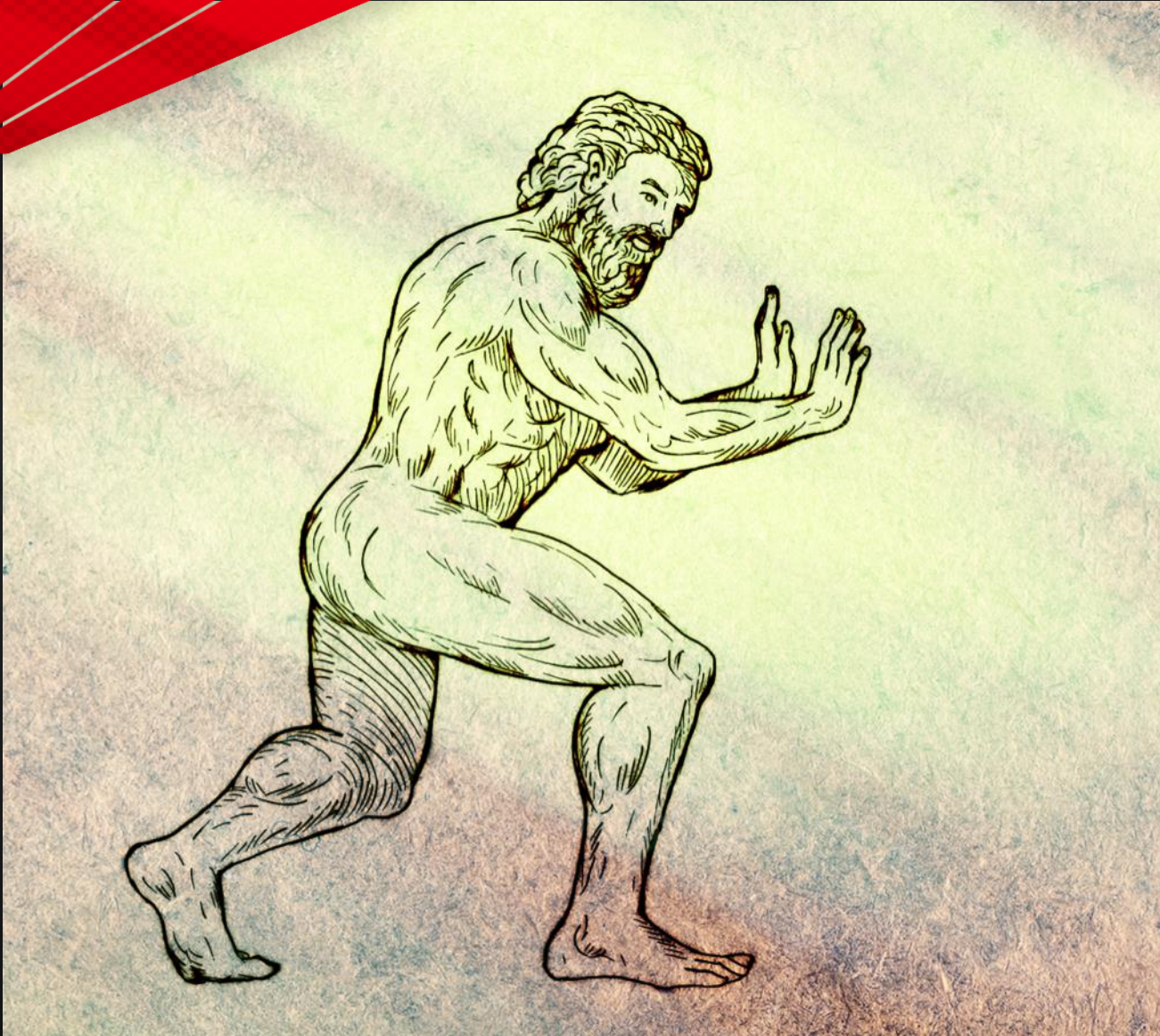
**PARISI**

REDEFINING  
FUNCTIONAL  
TRAINING

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## FUNCTIONAL:

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*Natural  
Movement  
With Natural  
Resistance*

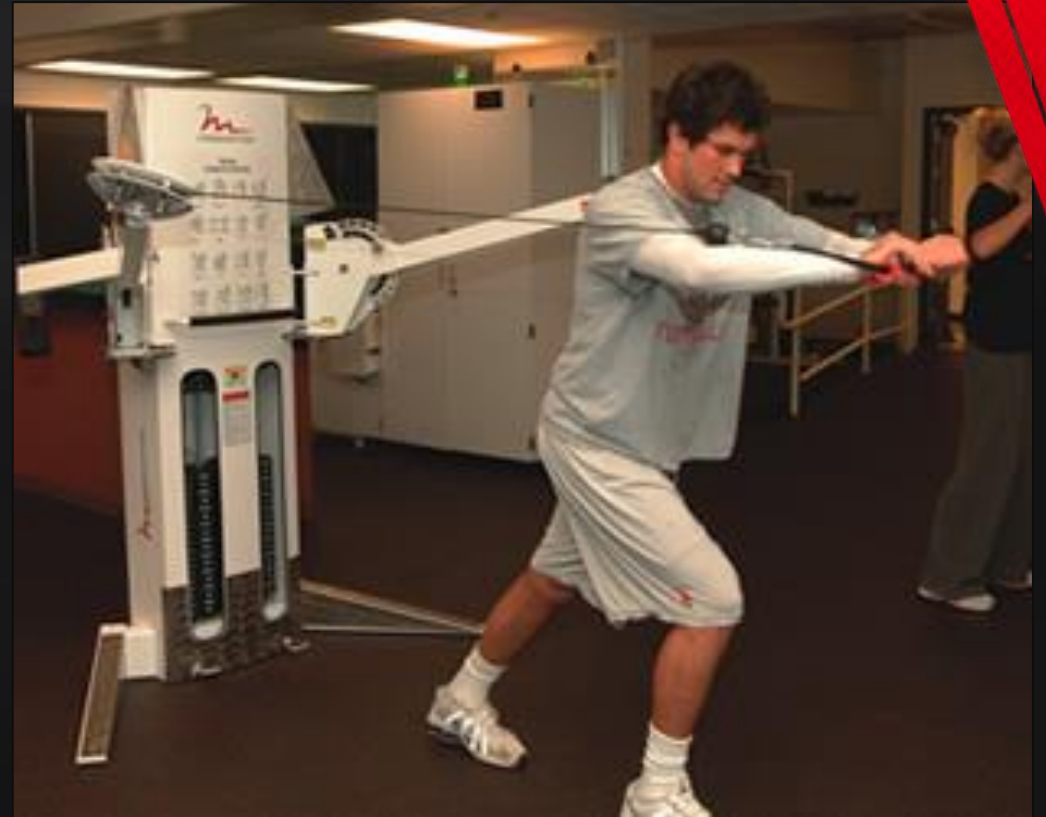




## FULLY FUNCTIONAL?



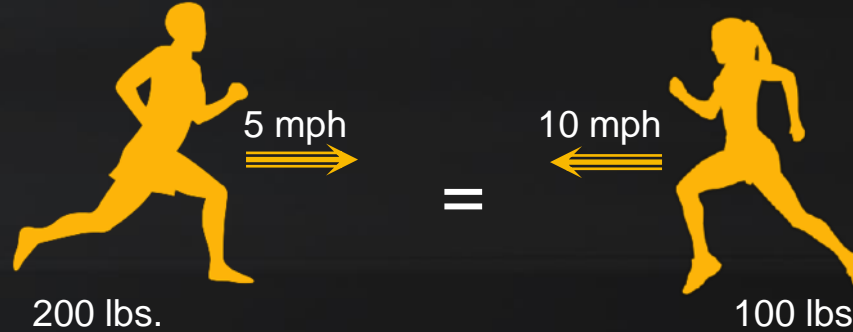
*We don't run against springs in nature.*



*We didn't evolve to push against gravity on a horizontal plane.*

# MOVEMENT DEFINITIONS

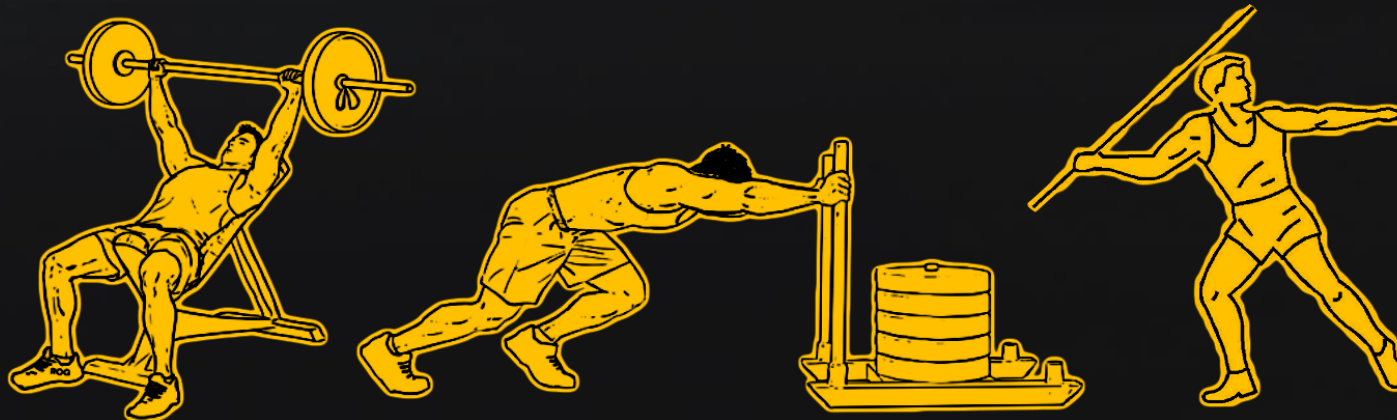
**MOMENTUM:** Mass x Velocity



**ACCELERATION:** change in speed

**FORCE:** the act of exerting pressure against an object.

- Gravity – Barbell
- Friction – Sled
- Acceleration - Javelin





# MOVEMENT DEFINITIONS

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**POWER** = Force x Speed

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**STRENGTH** :

Maximum force a muscle can generate at a specific velocity.

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**WORK** = Force x Distance



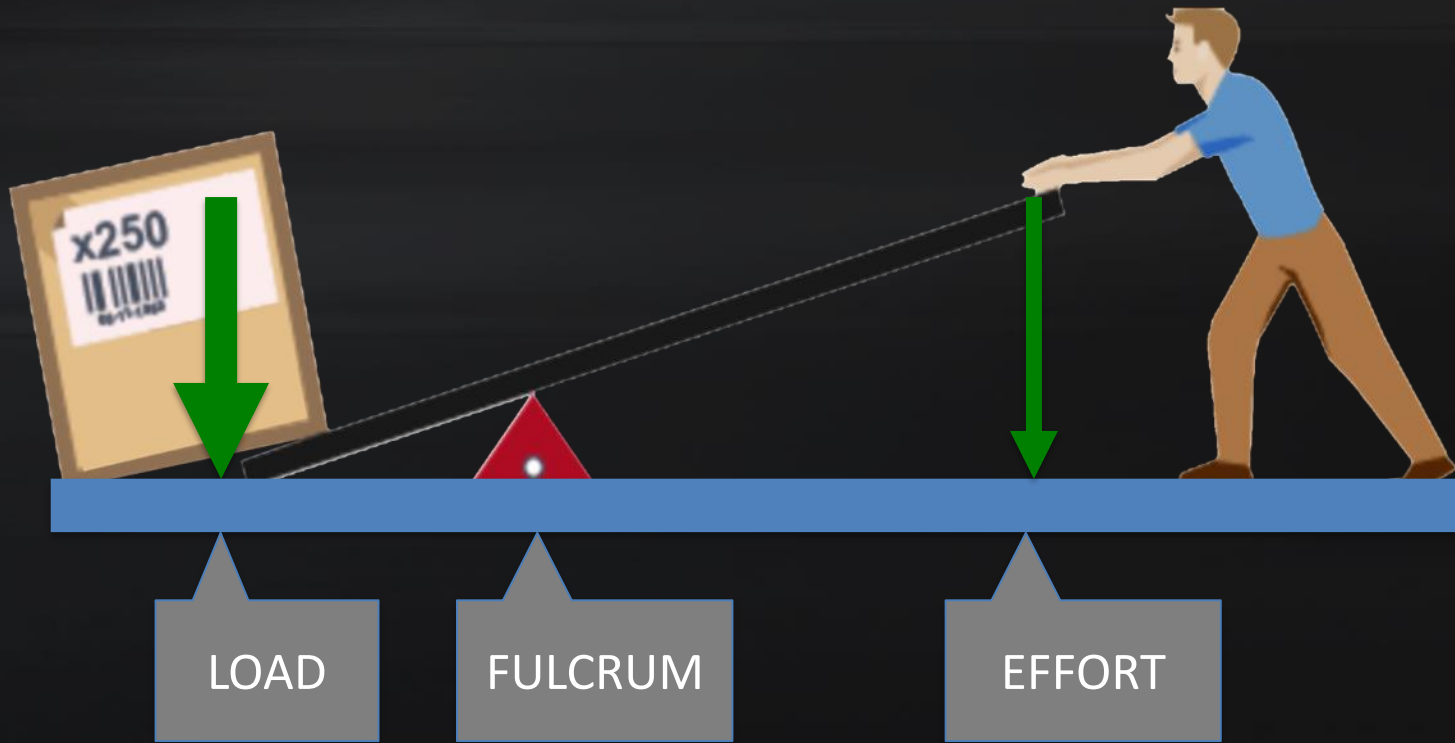
STICKING POINT



LIMITATIONS  
OF TRADITIONAL  
RESISTANCE  
TRAINING

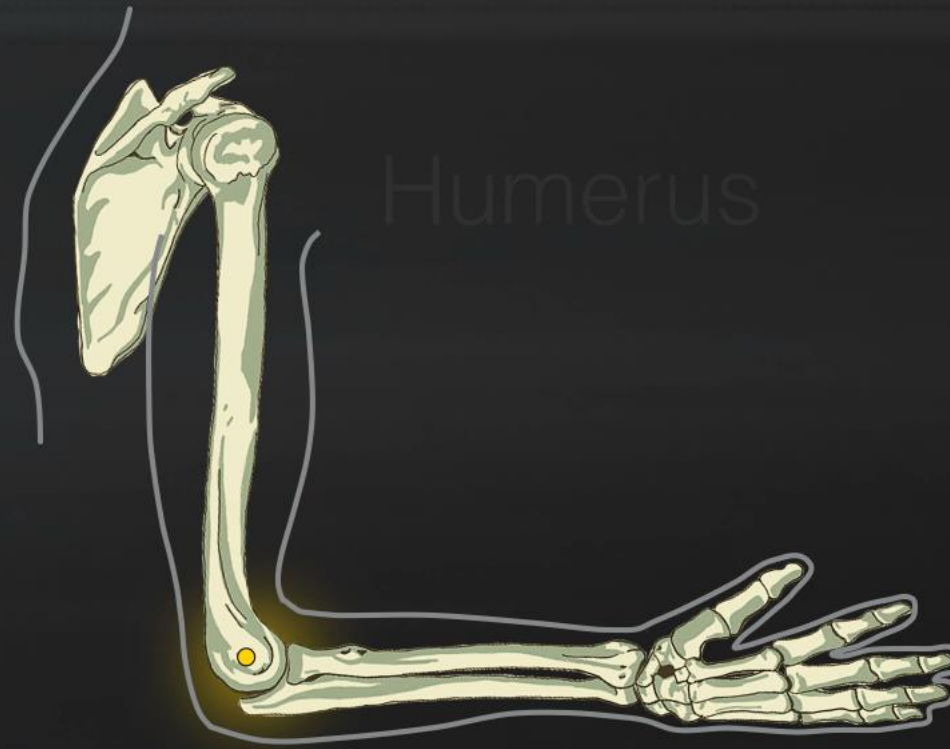
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LEVERAGE &  
MECHANICAL  
ADVANTAGE

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Humerus

## HUMAN ANATOMY

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*Leverage & mechanical advantage*





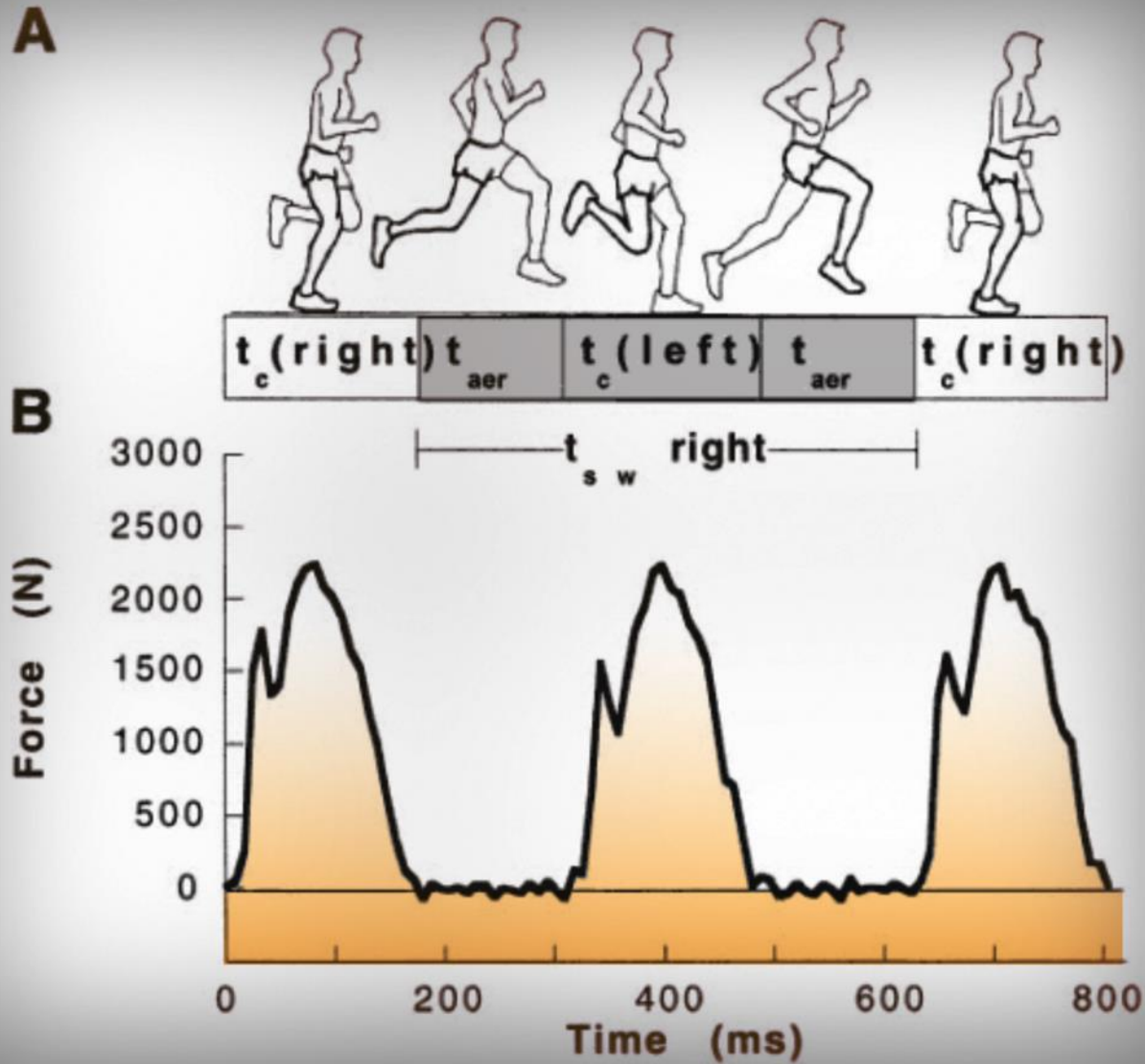
# FORCES REQUIRED TO MOVE A WEIGHT



# FORCES REQUIRED FOR PROPULSION



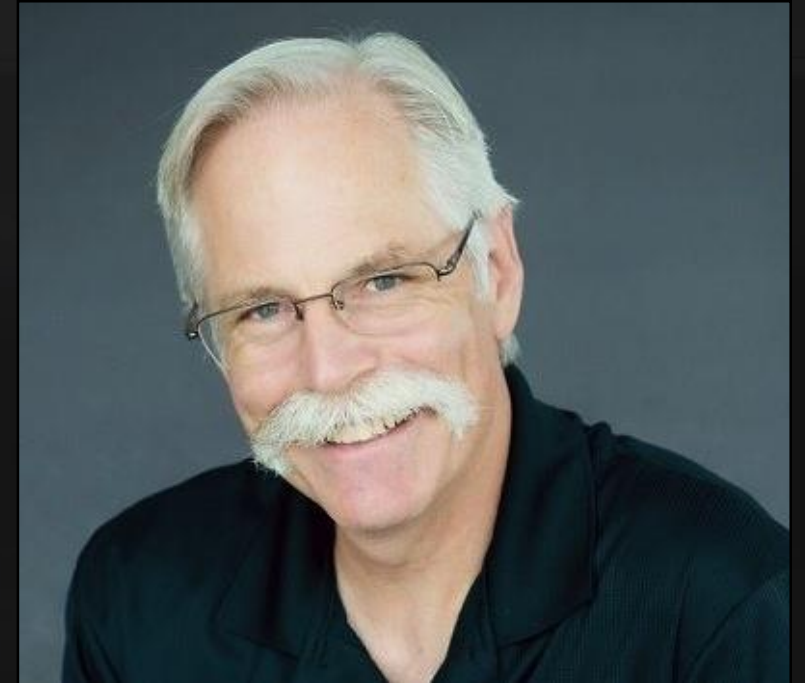
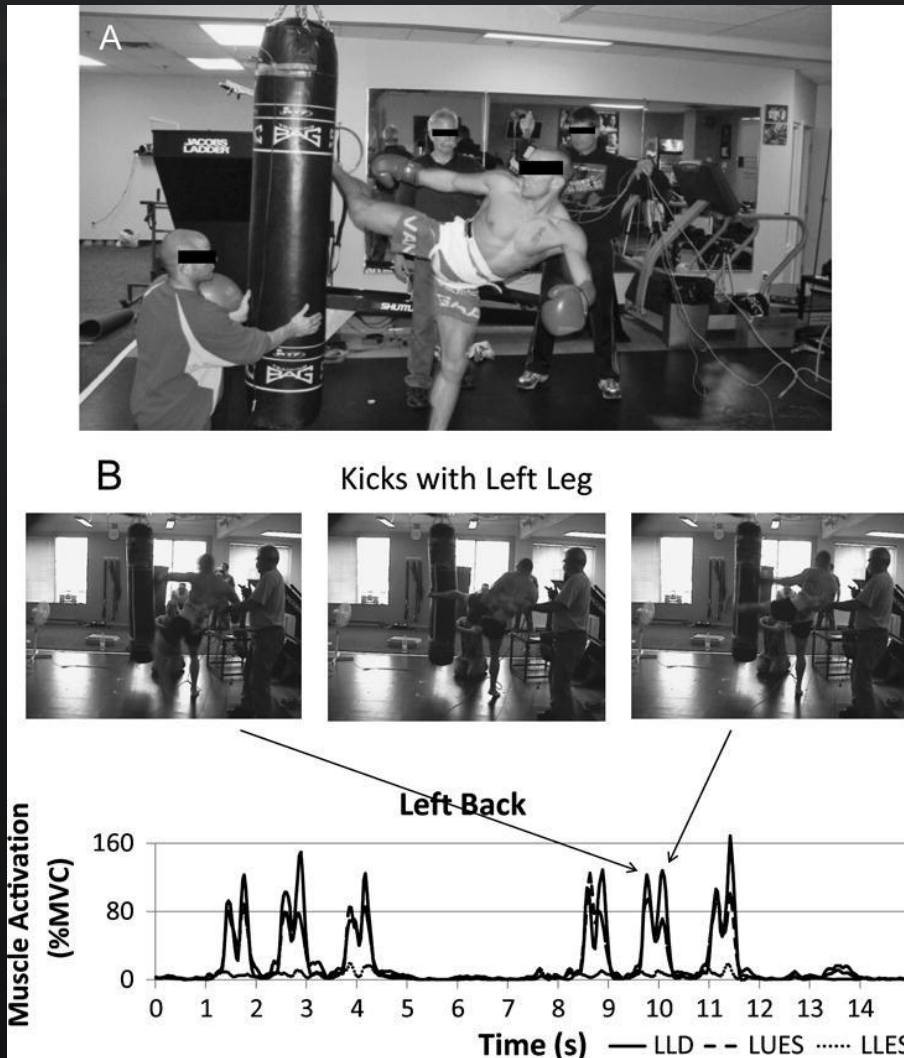




FASTER SPEEDS ARE  
ACHIEVED  
WITH GREATER  
FORCE NOT MORE  
RAPID MOVEMENT

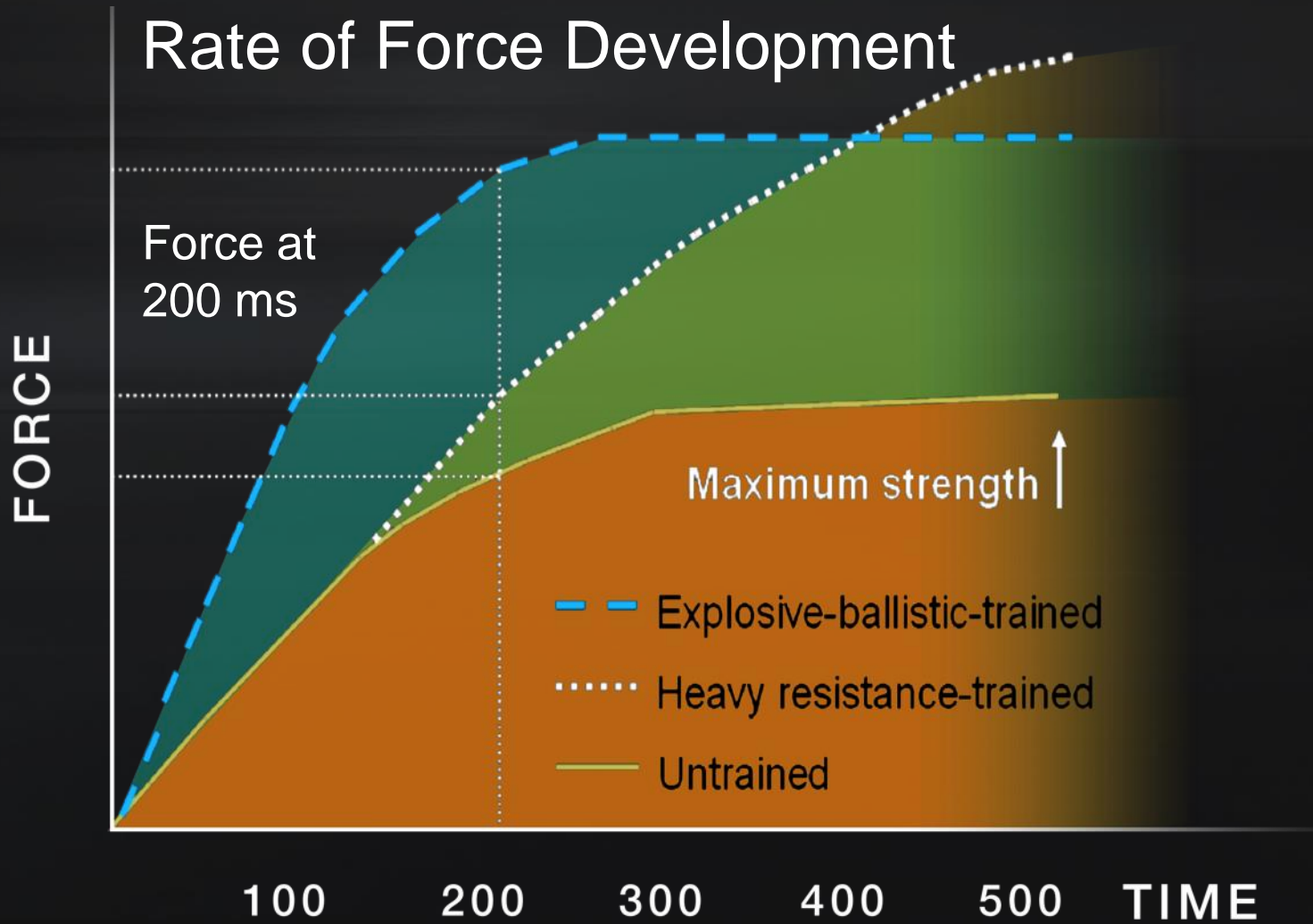
# “THE SPEED STRENGTH PARADOX”

Stuart McGill



Source: *The Journal of Strength & Conditioning Research*, 24(2), 348-357 (2010).

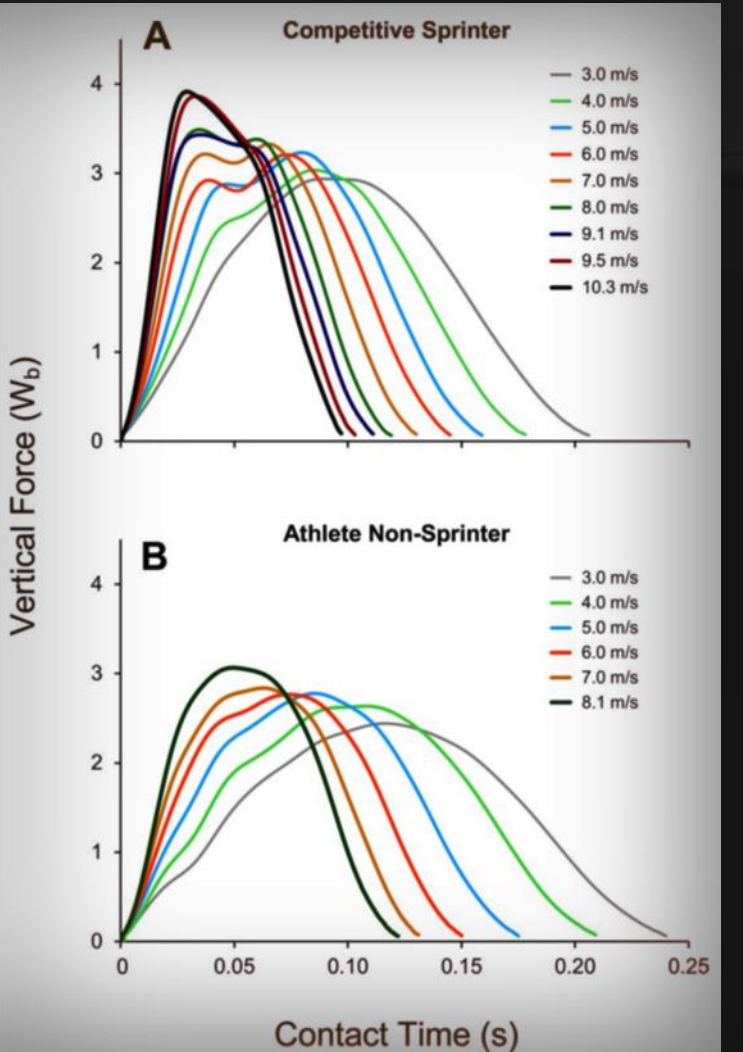
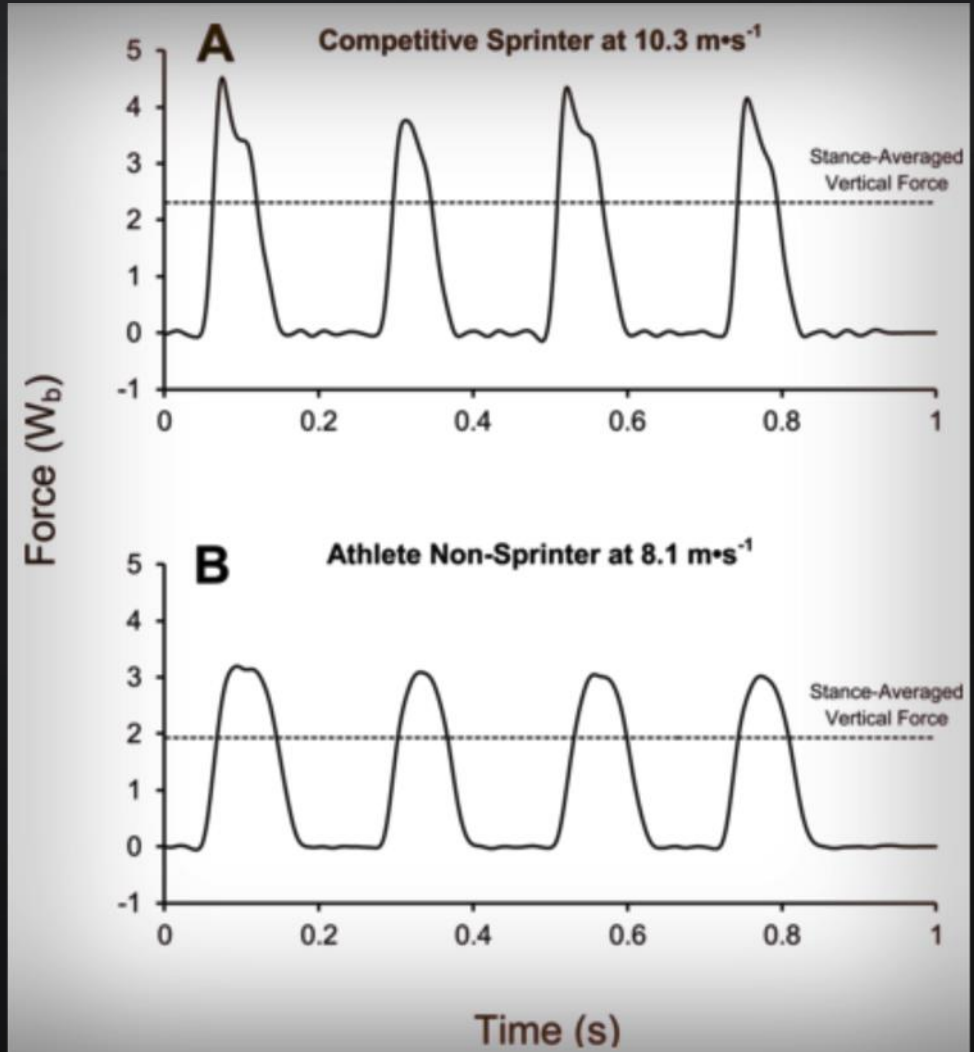
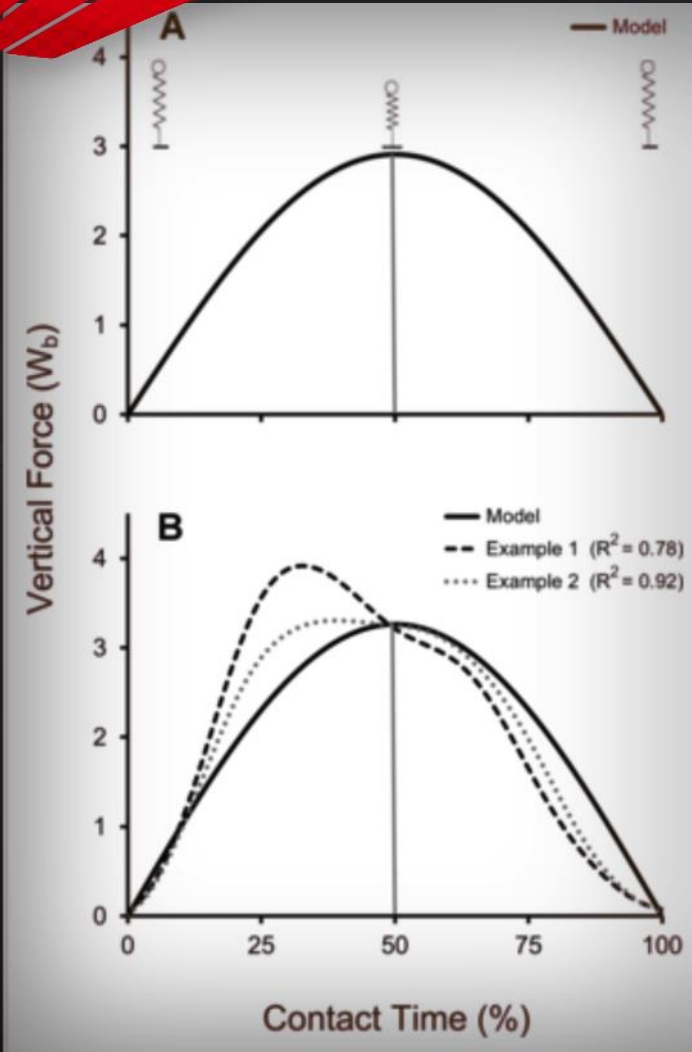




WHAT DOES  
IT MEAN TO  
PULSE A  
MUSCLE?

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# FORCE SIGNATURES



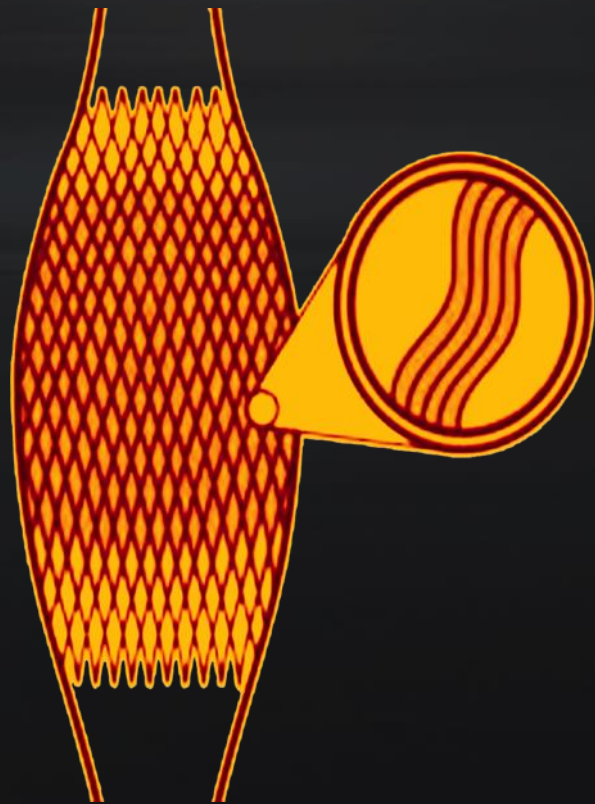




WHAT TYPE  
OF ATHLETE  
ARE YOU  
DEALING  
WITH?

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**ACTIVE YOUNG**



**SEDENTARY OLD**

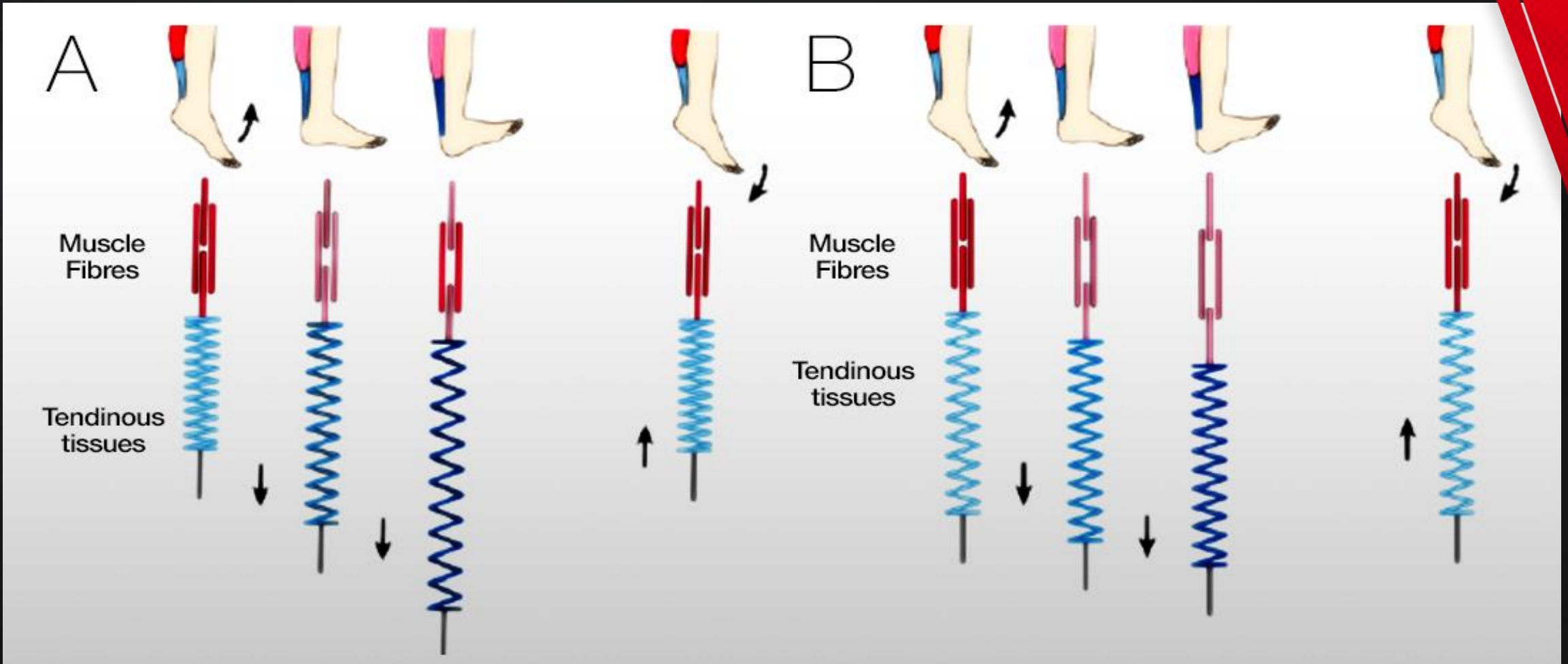


FACIA TISSUE IN  
ACTIVE YOUNG  
VS  
SEDENTARY OLD

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# THE CATAPULT MECHANISM: ELASTIC RECOIL OF FASCIAL TISSUES



# DOWN STROKE ABSORPTION ENHANCES THE DRIVE PHASE







# LOADING AND HYDRAULICS IN HUMAN MOVEMENT

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*Athletes Must be Trained in  
Accordance With Their  
**Unique Impulse Signature***



# SPRINT ACCELERATION MECHANICS

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*JB Morin – Sport Science  
Research Institute , New Zealand*





# THE FUTURE OF RESISTANCE TRAINING



Delta-Kinetic Resistance™

# TRAP BAR VS. ISOKINETIC AT COMMON VELOCITY



*Subject A on Trap Bar*

*380 lbs (~92% 1 Rep Max)*

*1.04 m/s*



*Subject A on DMX*

*Intensity 2*

*1.12 m/s*



Subject A – Trap Bar – 90% 1RM



Subject A – Isokinetic Slow Speed



Subject B – Trap Bar – Light Load / Fast Speed



Subject B – Isokinetic - Fast Speed



# THE FUTURE OF RESISTANCE TRAINING

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+

Infinitely Accommodating – User-Directed Resistance

+

Compound Functional Movements

VS.

Single-Joint Rotational Movements

+

Resistance on Any Plane of Motion at Any Speed



The background of the slide is a dark, high-contrast photograph of a runner in a starting crouch on a track. The runner's body is silhouetted against a dark background, with a bright red diagonal band at the top. A green, glowing waveform graphic is overlaid at the bottom, appearing to emanate from the runner's feet.

# THE NEW SCIENCE OF SPEED TRAINING: OPTIMIZING INDIVIDUAL FORCE SIGNATURE

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*Increase Speed + Reduce Injury*

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# THE NEW SCIENCE OF SPEED TRAINING

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*Questions?*

**THANK YOU!**