

Theory and concepts for athlete development TFC Clinic

Cal Dietz

Process for Creating New or Modified Methods/Formulas

Triphasic Problem Solving Method

Step 1

Question methods

Step 2

Creates a new problem(s)

Step 3

Find solution



QUESTION

My athletes move differently on court than in weightroom? (2008)

PROBLEM

I'm not training them correctly

SOLUTION

Do jumping on toes!!!

Since 2008, my athletes jump and
Squat(2012) on their toes

Lifts that are completed on toes:

Most Squats

Lunges

Step Ups

Pit sharks

All Plyometric jumps are on toes!

Which Position is More Athletic?





Sean Donnelly Completing Reps 800 Pound Single Leg SB SQ

Body Functions That by Improve Squatting on Toes

If arch colapes in foot

Brain down regulates to protect.

Glutes down regulates force - Bosu work for power

Hips lock down for stability

Lower back tightens for stability

Lateral Sling for balance ,Change of Direction and Hip levels in sports is high

Safety Bar Split Squat - Most Effective Athlete Lift Video Part 1 & video Part 2



Hormonal Response

Vascular Response

Structural Adaption –
Bone – Joints Hips

Safety Bar Split Squat

Cal Dietz

The Lift

Safety Bar Single Leg Squat

The Lift

<https://www.youtube.com/watch?v=xJDp5Nk6Dsg>

Supramaximal Safety Bar Single Leg Squat the Lift

<https://www.youtube.com/watch?v=fVgPEBuUok8>

Overview

Results we have seen

Why Safety Bar Split Squat?

Why Supramaximal?

Eccentric and Isometric Implementation

Eccentric and Isometric Specific Adaptations

What We Have Seen SBSS

Nervous System

Throwers didn't back squat...
600 pound to 660
Gained AVERAGE 57lbs on
squat in 8 weeks

Cardiovascular System

Week 0: 65-70 resting heart
rate (RHR)
Weeks 1-3: 55-60 RHR *GPP*
Weeks 4-5: 48-52 RHR *ECC*
Weeks 6-7: 32-38 RHR *ISO*

Muscular System

Female Athlete Women
150 body weight
455 Safety Bar Squat

Single leg - 800 Pounds

<https://www.youtube.com/watch?v=H4SLuXqxWmg>

Why Safety Bar?

Lower body → Unilateral, total body
Global stressor

Less Loading on the Spine

Sport-Specific

Increased stress on individual leg muscles

No hands placed on Safety Bar

Removes balance from equation

Allows for heavier loads used

↑ Core Stabilization?



Why Supramaximal?

STRESS

SUBmaximal ECC and ISO is not enough

Various mechanisms allow body to lower more weight than lift

E.g. 120% ECC = 100% CON

With this, 90% CON = 70% ECC!!!

Not enough!

Greater hormone release - Bioenergetics Integration Dynamics Youtube

Must monitor cortisol - sets are under 10 seconds

Breaks down NEW tissue first

Where does this go in my cycle? - The Hack

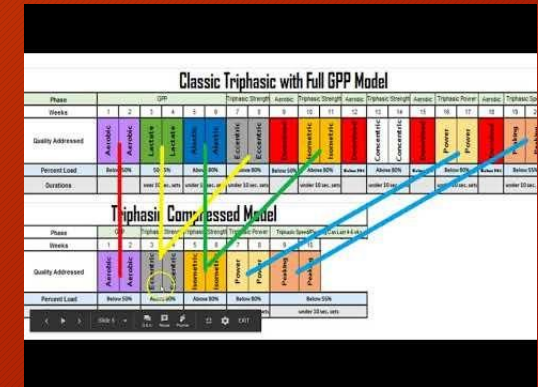
Classic Triphasic with Full GPP Model

Phase	GPP						Triphasic Strength		Aerobic	Triphasic Strength		Aerobic	Triphasic Strength		Aerobic	Triphasic Power		Aerobic	Triphasic Speed	
Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Quality Addressed	Aerobic	Aerobic	Lactate	Lactate	Alactic	Alactic	Eccentric	Eccentric	Download	Isometric	Isometric	Download	Concentric	Concentric	Download	Power	Power	Download	Peaking	Peaking
Percent Load	Below 50%		50-55%		Above 80%		Above 80%		Below 50%	Above 80%		Below 50%	Above 80%		Below 50%	Below 80%		Below 50%	Below 55%	
Durations			over 10 sec. sets		under 10 sec. sets		under 10 sec. sets			under 10 sec. sets			under 10 sec. sets			under 10 sec. sets			under 10 sec. sets	

Triphasic Compressed Model

Phase	GPP		Triphasic Strength		Triphasic Strength		Triphasic Power		Triphasic Speed/Peaking Can Last 4-6 wks	
Weeks	1	2	3	4	5	6	7	8	9	10
Quality Addressed	Aerobic	Aerobic	Eccentric	Eccentric	Isometric	Isometric	Power	Power	Peaking	Peaking
Percent Load	Below 50%		Above 80%		Above 80%		Below 80%		Below 55%	
Durations			20-30 sec. sets		under 10 sec. sets		under 10 sec. sets		under 10 sec. sets	

Full Video:



Very useful in all training cycles

Go From 800 pounds Supramaximal - to
[Band Speed Safety Bar Single Leg Squats](#)

I like this lift better

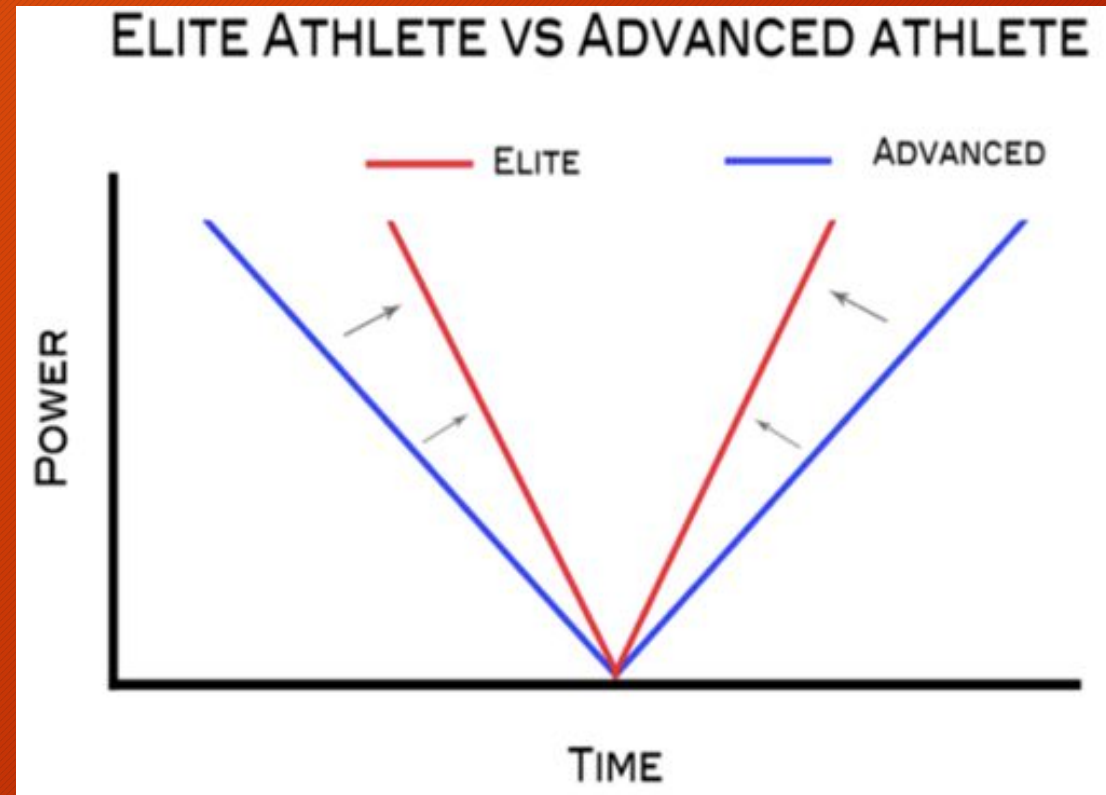
Band Resisted Hex Bar Drop Jump

<https://www.youtube.com/watch?v=RHbbXx7P3e4>

Full Video:

Triphasic Muscle Action

- Every movement contains 3 phases
 - Eccentric
 - Muscle lengthening
 - Isometric
 - No length change
 - Most commonly missed action
 - Concentric
 - Muscle shortening
- Ultimate goal is improving efficiency and power of SSC



How to Implement - ECC

First training block

Tempos

Monday - :07

Wednesday - Any Implement @ 90-97%

Friday - :10

Pairings

French Contrast Exercises

Prehab Exercises

Equipment

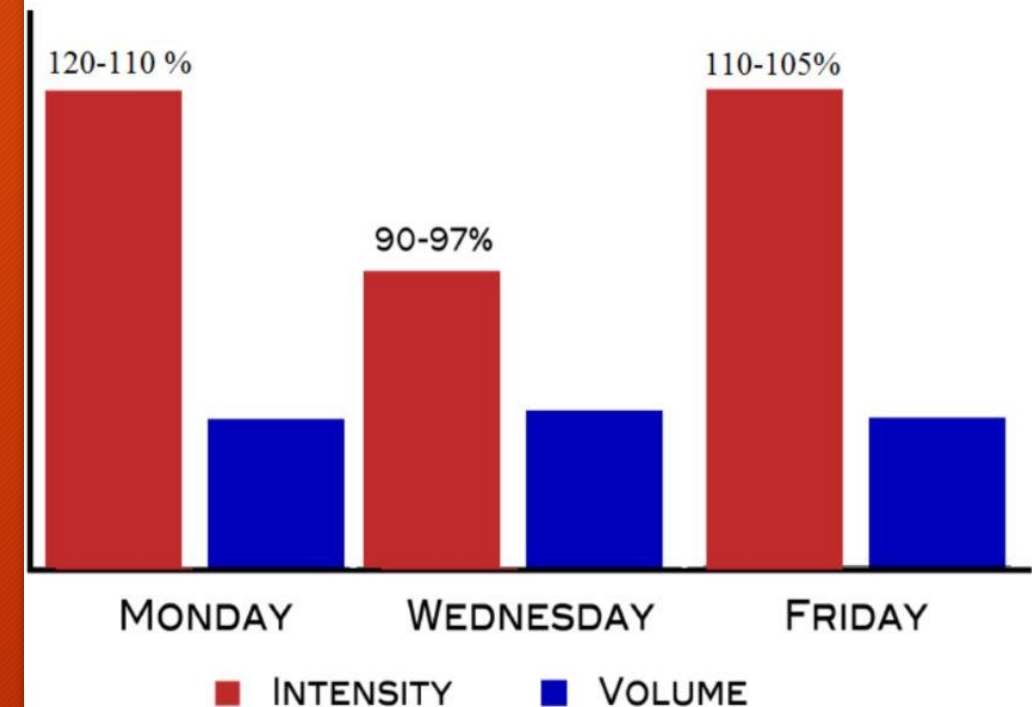
Safety Bar

Weight Releasers

Fixed Barbell for hands-on assistance

Hex Bar

Supramaximal Weekly Loading



Coaching Cues - ECC

Adjust height of bar, crash bars, weight releasers accordingly

Spine neutral with chest up

Front and Back Leg at 90° at Knee and Hip

Don't let back leg get too extended

Belly Breathe in, out, and hold breathe out

Slow, smooth and controlled descent

Make sure descent is even throughout specified tempo

Big toes and Glutes!

Explode up!

2 spotters on either side of bar assist for fast CON

Example:



How to Implement - ISO

First training block

Tempos

Monday - :07

Wednesday - Any implement @ 90-97%

Friday - :10

Pairings

French Contrast Exercises

Prehab Exercises

Equipment

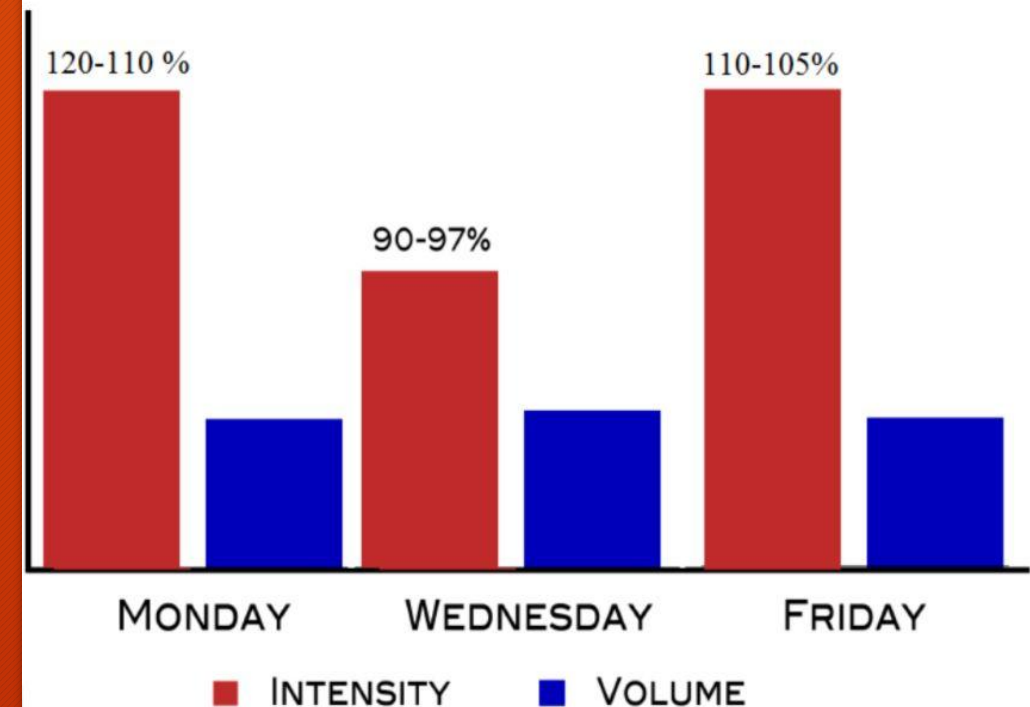
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Coaching Cues - ISO

Adjust height of bar, crash bars, weight releasers accordingly

Spine neutral with chest up

Front and Back Leg at 90° at Knee and Hip

Don't let back leg get too extended

Belly Breathe in, out, and hold breathe out

Controlled descent into position with hard stop

Hold position for specified tempo

Drop to engage weight releasers

Big toes and Glutes!

Explode up!

2 spotters on either side of bar assist for fast CON

Example:



Eccentric Muscle Contractions

Why?

Sport-Specific FORCES

↑ Resiliency

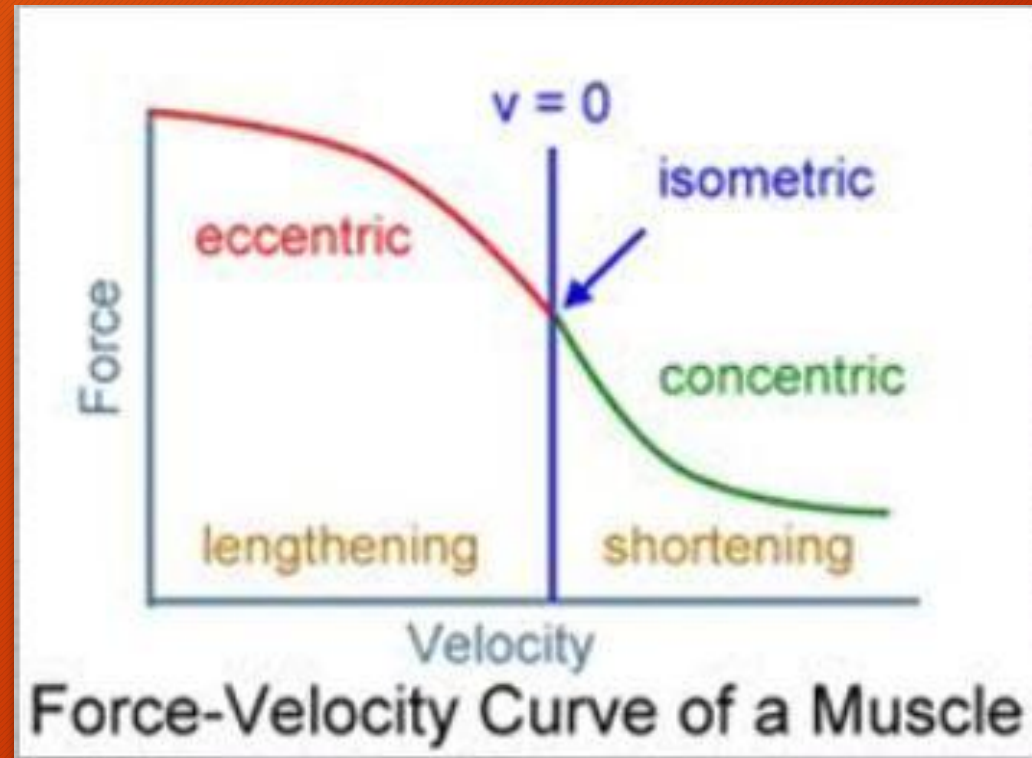
↑ potential for ↑ RFD

Can't produce what
you can't absorb

Altered Motor Unit
Recruitment

Maximal stress placed
on minimal FT fibers

FT Hypertrophy



Eccentric Muscle Contractions, Cont'd

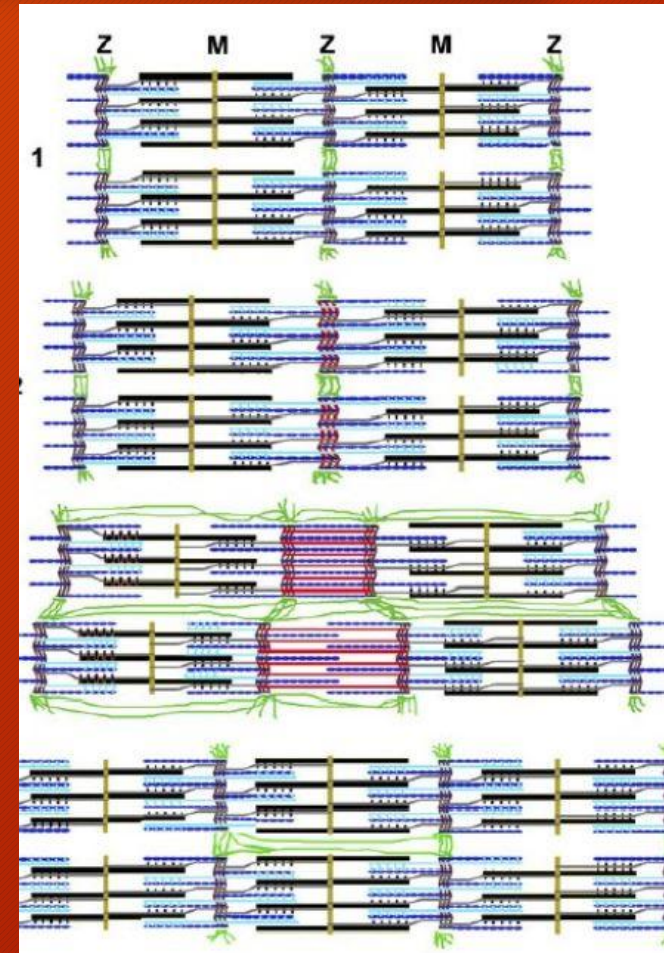
Tissue Remodeling

Sarcomerogenesis

More force produced at longer lengths

Protein synthesis signaling complexes

FT Fiber-Specific Hypertrophy



Isometric Muscle Contractions

Why?

Bridges gap of ECC → CON
ISO = “Clutch” of dynamic movement

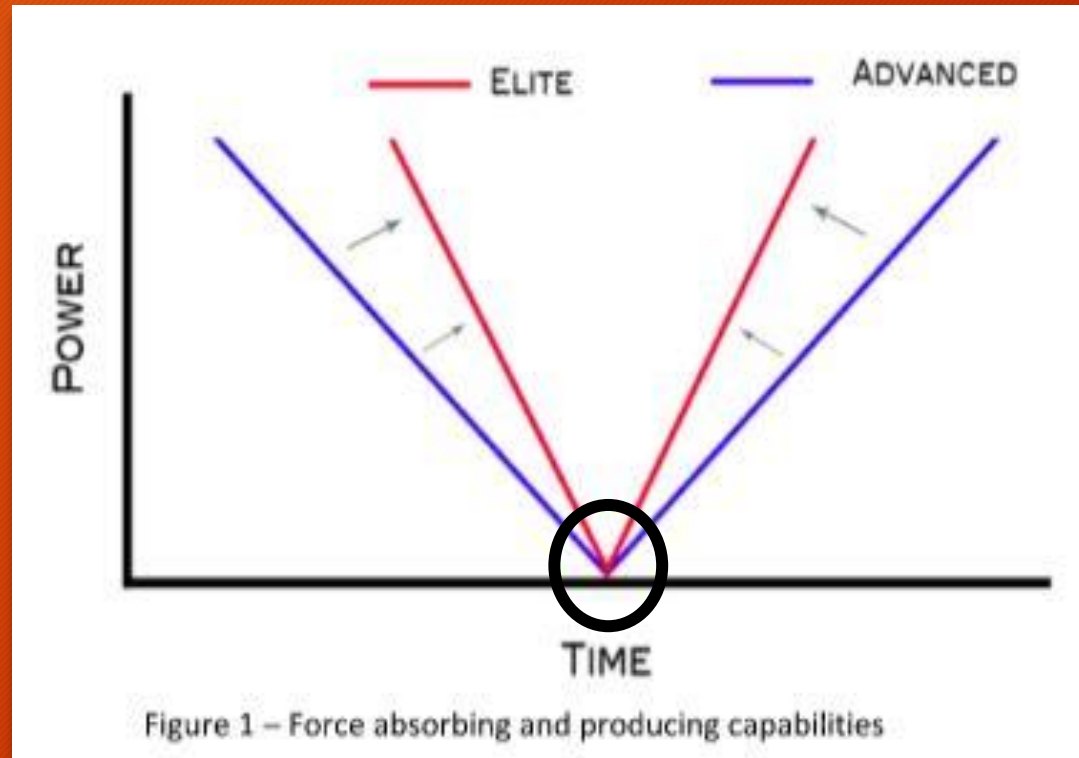
↑ Angle-Specific Force

↑ RFD

Sport-Specific Angles can be mimicked

Fibers are fired and re-fired quicker

Faster signal transduction
Thickening myelin sheaths



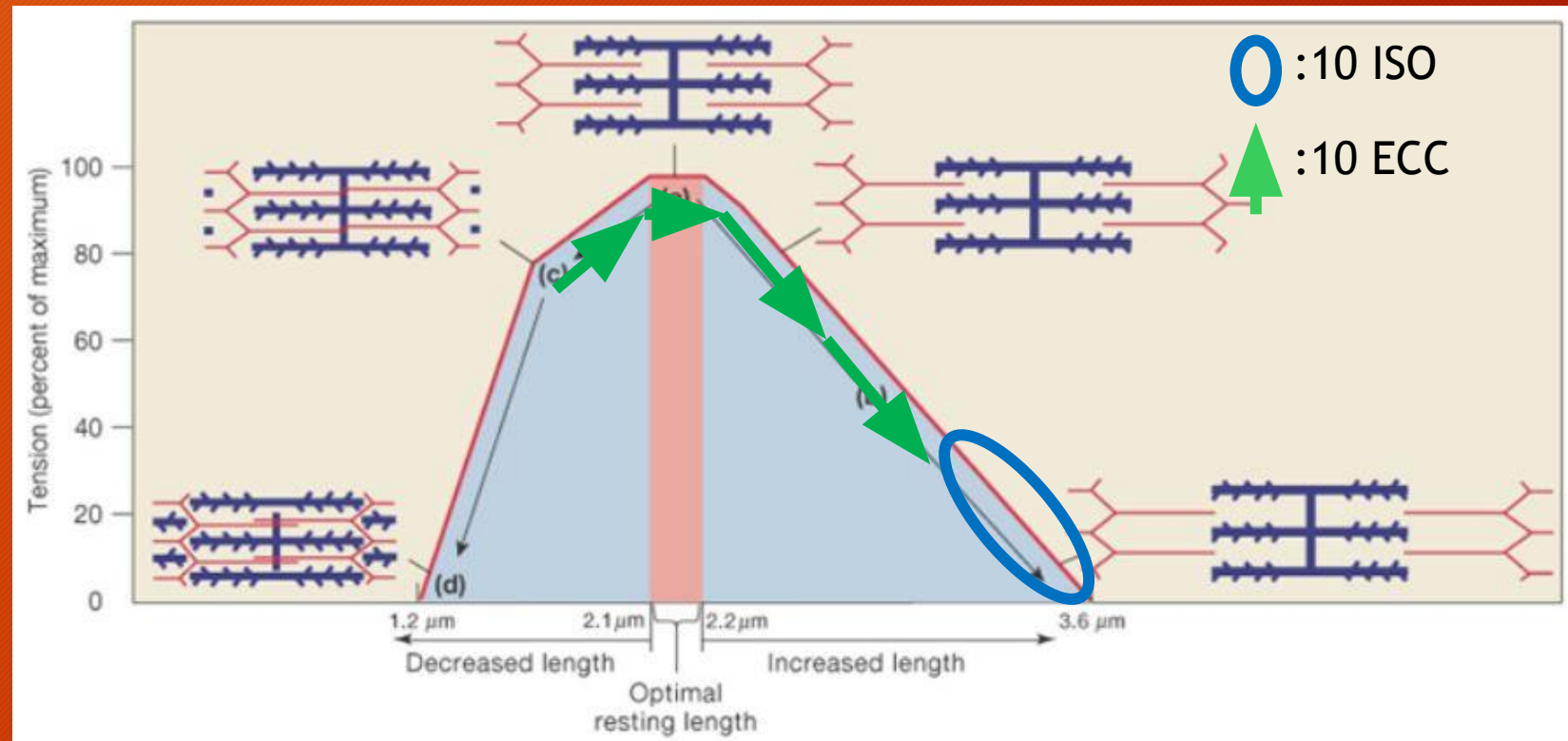
Isometric Muscle Contractions, Cont'd

Performed in the weakest position of movement for duration of set

Vs. ECC where little time is spent at weakest position

More metabolically taxing

Have seen as far as 20% higher in ISO than ECC



Split Squat Isometric Variation

- Rack Deadlift Iso
 - Create long position reaching back with rear leg/foot
 - Slightly elevate front heel
 - Pinch shoulder blades
 - Maintain neutral spine and neck position
 - Head up
 - Eyes looking forward



Single Leg Isometric Deadlift



Single Leg Isometric Deadlift



A More Sport Specific lift to Replacing Olympic Lifts

My History of Olympic Lifts

Problems With Olympic Lifts- Lack of Transfer in Sport - Learning Curve

Lack of Specificity to Force and Transfer of Power

The Replacement Lift

[Band Resisted Hex Bar Drop Jump - youtube](#)

Results 5 to 10 time the force when you calculate time = Magnitude

[Band Resisted Hex Bar Reactive Jump - youtube](#)

Results 3 to 5 time the force when you calculate time = Magnitude

Experienced Olympic lifters and first day doing exercise above
Squat Jump with Hex Deadlift

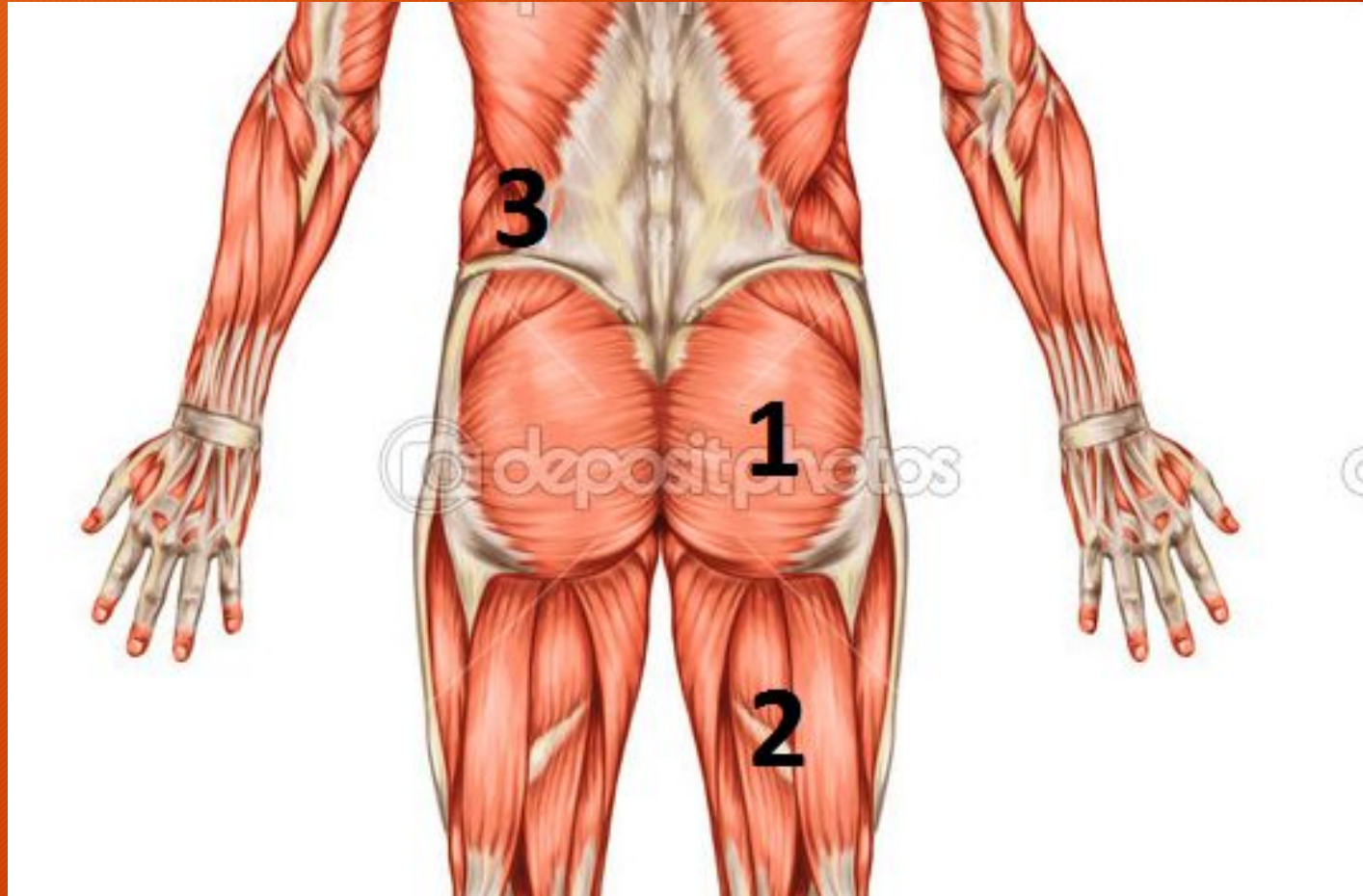
Key factors in coaching Posterior Chain

Squeeze Big Toe

On the way up or concentric

Reverse hyper - Glute ham hyper - RDL - Straight leg Deadlift

Correct Hip Extension Firing Pattern Global Neurological Sequencing (GNS)



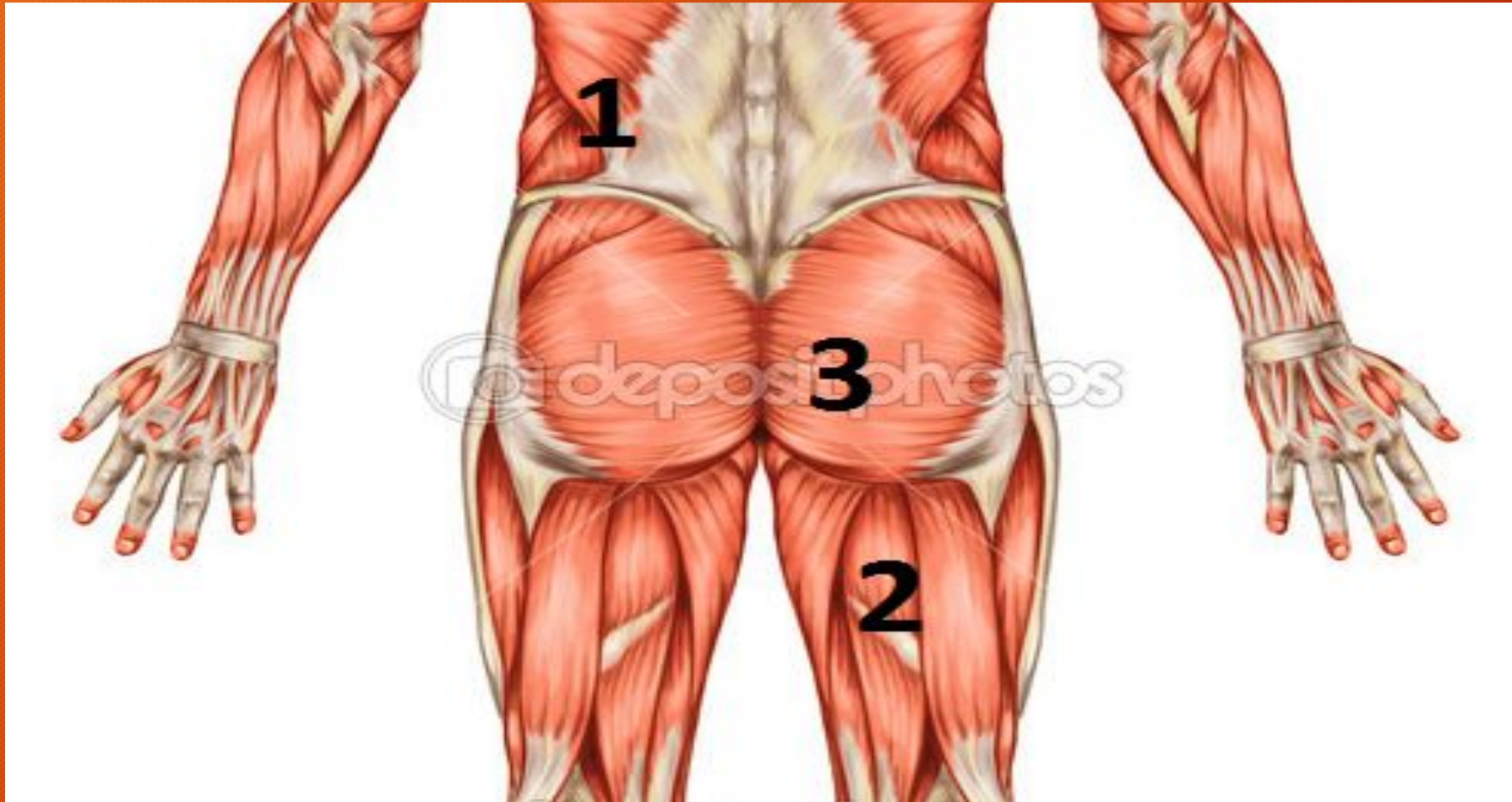
Wrong Hip Extension Firing Pattern

Primary Neurological Compensation Pattern(PNCP)



Wrong Hip Extension Firing Pattern

Primary Neurological Compensation Pattern(PNCP)



Single Leg Reverse Hyper



- Straight leg
- Toes down
- Drive against resistance consistently, maintaining pace for entire ECC portion
- Finish with a full, un-resisted rep

Hyper Speed Method

Peaking Manual

400 plus exercises in peaking manual

Two Exercises for Neural Adaptation

Hamstring Bent Knee AFSM Co-contraction Speed

Two Exercises for Neural Adaptation

Rear Delt Prone Incline Lateral AFSM Cocontraction

Athletes of Highest Level Can Relax Faster

Based on Sherrington's Law

- Matveyev → 200% faster!

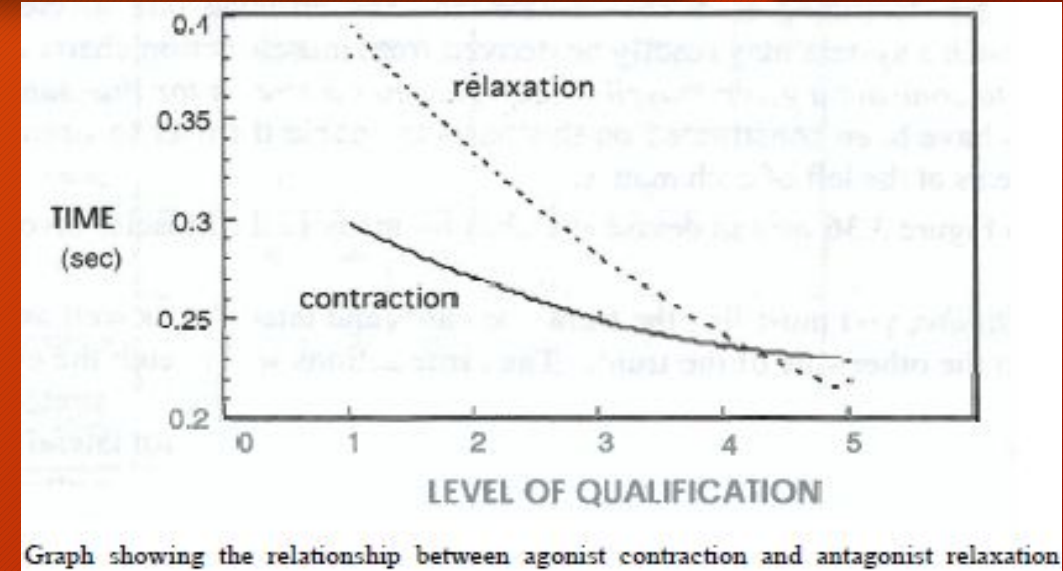
How do we train this?

High velocity strength & shock & plyo methods

- Enhance Transfer

•

- Mel Siff Camp



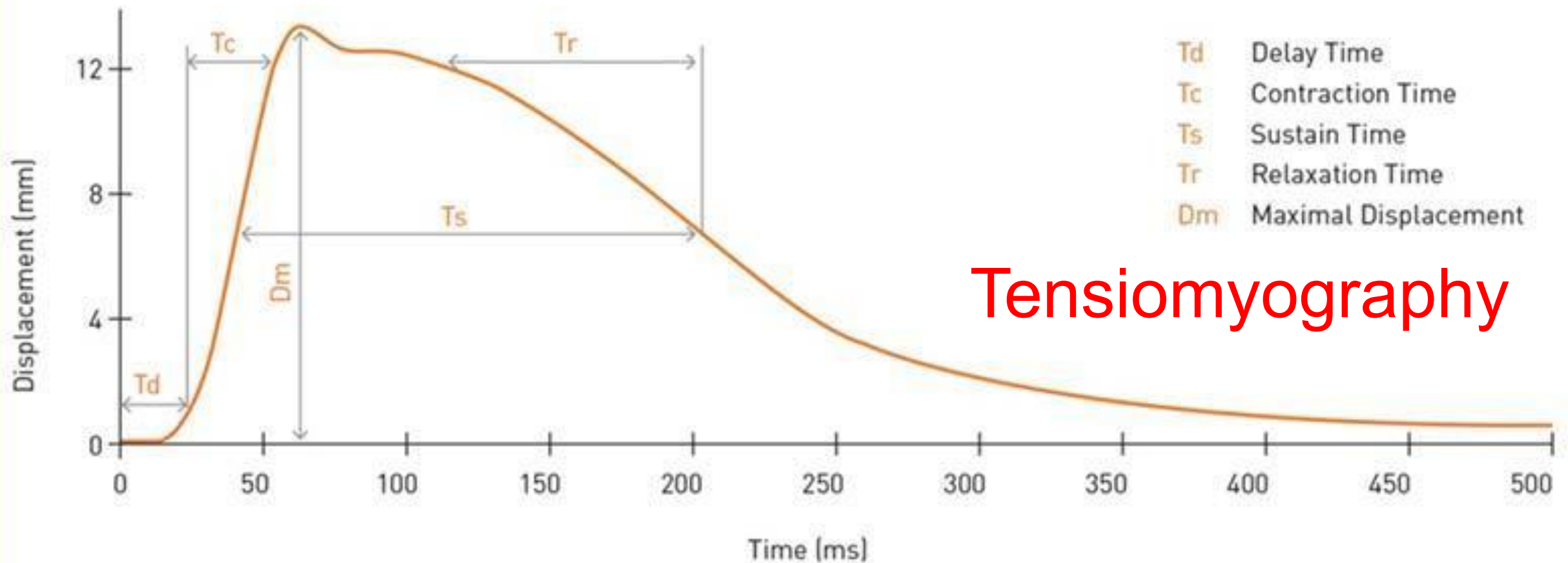
Triphasic Training Peaking Method Manual

The 3 most specific methods to train muscle for high performance:

Method 1 - Co Contraction - Neural Adaptation for Sport

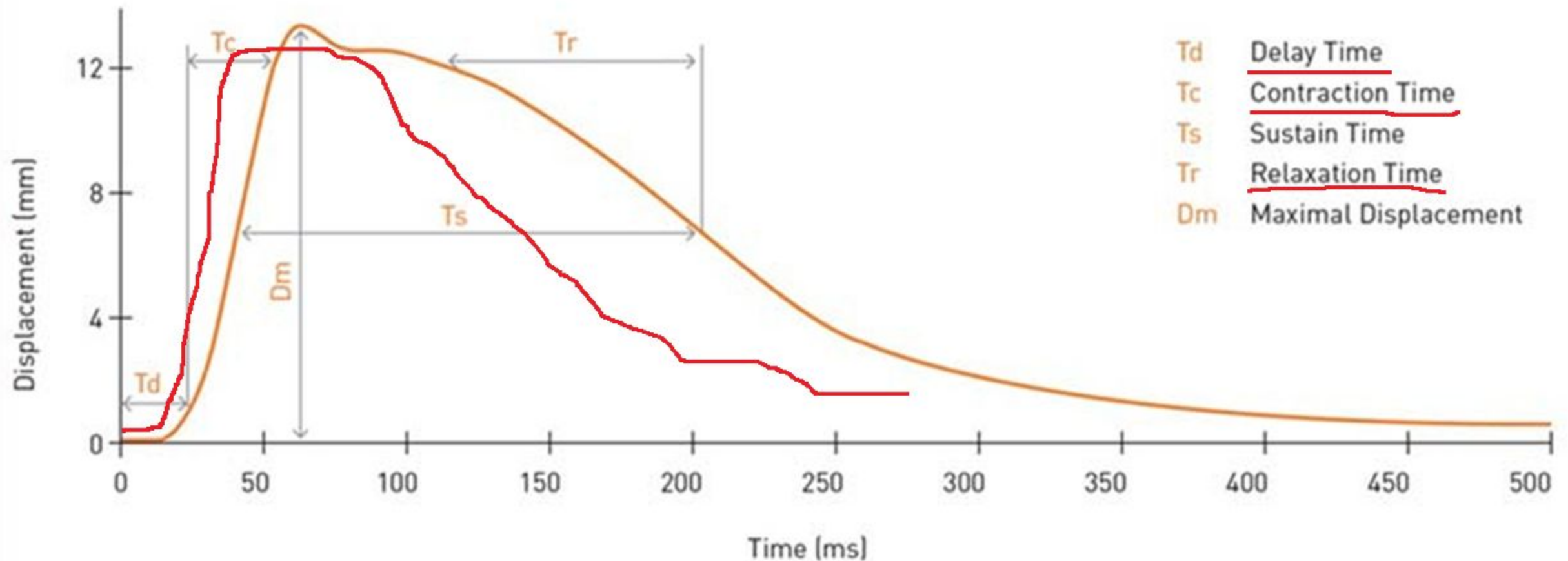
- Limb is in between bands for max speed and velocity
- High neural adaption for speed of muscle contraction and relaxation

Tensiomyography Qualities of Muscle



Tensiomyography

Qualities That Improve In Muscle - TMG



Triphasic Training Peaking Method Manual

The 3 most specific methods to train muscle for high performance:

Method 2 - Rebound Shock Method - Tissue Adaptation for Sport

- Limb is on Top of Bands with light weight
- Great Tissue Response 2 Spring System

youtube - Triphasic Training Spring Model Tissue Concepts

Two Exercises for Tissue Adaptation

Bent over OH supra Rebound Shock

Two Exercises for Tissue Adaptation

Psoas Prone Banded Rebound Shock

Triphasic Training Peaking Method Manual

The 3 most specific methods to train muscle for high performance:

Method 3 - Oscillatory Isometrics (OCI) - Metabolic Adaptation for Sport

- Limb is under constant tension
- High Velocity Contraction under Fatigue

Two Exercises for Metabolic Adaptation

Bent Over Rear Delt OOI

Two Exercises for Metabolic Adaptation

Shoulder Abduction Bent Arm OCl

Summary of Spring Ankle Positions

10 Total Exercises
5 Isometric Position - With Toe/Foot
3 Position for Thigh- With 2 Foot
2 Foot Position
2 Toe Position

3 Thigh Positions

Deep/2 Ankle
Ankle



Mid/2 Ankle



High/1



Foot Positions for the 3 Range Thigh Positions

Ankle Position for Spring Ankle 1 & 3



Ankle Position for Spring Ankle 2, 4 & 5



Toe Positions

Toe Position 1 - Straight Toe



Toe Position 2 - Training Aid, $\frac{1}{2}$ Wood Dowel



Spring Ankle 1 - Deep thigh Position, Heel Down

**Spring
Ankle
Position 1 -
with Level 1
Bwt Loading**

**Build up to
60 Seconds
ASAP**



Spring Ankle 2 - Deep thigh Position, Heel Up

**Spring
Ankle
Position 2 -
with Level 1
Bwt Loading**

**Build up to
60 Seconds
ASAP**



Spring Ankle 3 - Mid thigh Position, Heel Down

Spring
Ankle
Position 3 -
with Level 1
Bwt Loading

Build up to
60 Seconds
ASAP



Spring Ankle 4 - Mid thigh Position, Heel Up

**Ankle
Position 4 -
with Level 1
Bwt Loading**

**Build up to
60 Seconds
ASAP**



Spring Ankle 5 - High thigh Position, Heel Up

**Ankle
Position 5 -
with Level 1
Bwt Loading**

**Build up to
60 Seconds
ASAP**



Advanced Spring Ankle Exercises

- It is very important that the athlete is able to maintain all 5 spring ankle positions with level 1 loading for 60 seconds before moving onto level 2 loading.
- Level 1 = Bodyweight only
- Level 2 = External Resistance - DB (Demo next slide)
- Level 3 = External Resistance - Pitshark , Partner Pushdown

More Spring Ankle Resources:

[Spring Ankle Concepts for Elite Performance Part 1 Injury and Forces](#)

[Spring Ankle Concepts for Elite Performance Part 2 Injury and Forces](#)

[Spring Ankle Concepts for Elite Performance Part 1 Warm up and Rehab Flaws](#)

[Spring Ankle Concepts for Elite Performance Part 2 Warm up and Rehab Flaws](#)

Advanced Spring Ankle Exercises - Demonstrations

**Level 2
Loading
Example of
Spring Ankle
Position 2**

**Duration 30
Seconds**



**Level 3 Loading
Example of
Spring Ankle
Position 2**

**Duration 10
Seconds**



Level 2: Dumbbell

Level 3: Pitshark

Level 3: Partner Pushdown