Ankles, feet and toes

Slow Guy

Speed School

www.slowguyspeedschool.com

Slow Guy Speed School

The Following Slow Guy Speed School Athletes Have Achieved All-State Status or Better:

York Track
Dan Palmer (State Champ)
Chris Carbonell
Nick Kuczwara (State Champ)
Alex Strand
Adam Zaremba
Kris Hinchley
John Fox
Nico Perrino
Khara Williams
Steve Cripe
Jimmy Sullivan
Kyle Khoury
Carl Carbonell
David Way
Tarrance Williams
Jeff Eich
Willie Sullivan
Chris Romancyk
David Byerly
Kevin Adamik
Conner Hennessey
Mo Watkins
Ron Hedman
Nick Sgarbossa (State Champ)
Reid Smith
Emmett McCoy
Jake Sackstetter
Josh Farrar
Jeff Ostling
Greg Gornick
Jarvis Hill
Itoro Akpakpan
Alex Teague

Montini Track
Maddy Jamrozek
Emma Makowski
Jenna Wiedacher
Gianna Salzbrun
Mitch West
Jeff Farnell (State Champ)
Will Smith
Nick Foster
Matt Quaglia

HC Track
Andrew Letts
Mike Mangan
Pat Dignan
Brad Musso
Matt Sperry
Justin Geiger
Alex Perkowski
Mark Perkowski
Miguel Manos
Lewis Bullock
Phil Stoudt
Matt Stone
Billy Fayette
Billy Magnessen
Kevin Huang
TJ Caveney
Josh Feldman
Blake Evertsen

Toni Kokenis (HC Basketball and Soccer)
Willie Sullivan (York BB)
Shane Molidor (DGS-State Champ-LJ)
Matt Anderson (HC Baseball)
Brien Rooney (Fenwick Football)
Stephanie Green (Hinsdale Central)
Pete Zavagnin (Nazareth Football)
Jack Allen (HC Wrestling)
Brian Allen (HC Wrestling)
Anne Yahiro (Benet LJ)
Liz Yahiro (Benet TJ)
Kinn Badger (GW Sprints)
Tess Johnson (DGN LJ)
Chelsea Celistan (HC)
Lauren Rousch (HC)
Kevin Tokarski (DGN Baseball)
Scott Skuteris (York FB)
Samantha Santulli (HC Lacrosse)
Kendall Santulli (HC Lacrosse)
Richard O'Rourke (DGN Football)
Brendan West (Texas State Champ 400m)
Ben Pratt (State Champ-Macomb)
Cody Cieslinski (DGN Football)
Megan Bonfield (DGN)
Ryan Clevenger (DGN)
Peter Hennigan (HC Tennis)
Martin Joyce (HC Tennis)
Sabrina Rabin (St. Charles North)

World Champions
Chris Brown

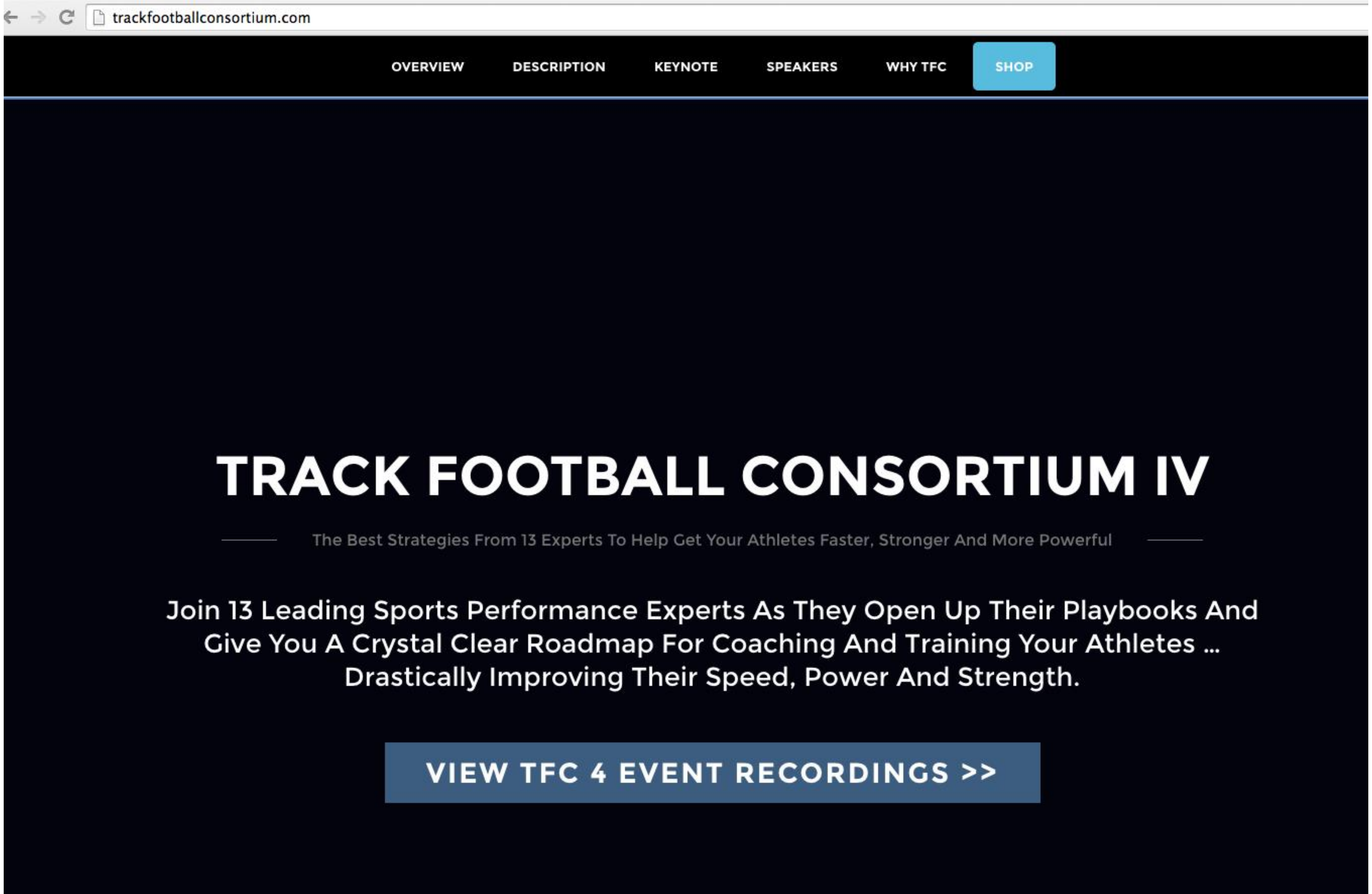
Olympians
Chris Brown (Bahamas)
Trevor Barry (Bahamas)
Vika Rybalko (Ukraine)
Korath Wright (Bahamas)
Lavern Eve
Andretti Bain

All-American
Nick Kuczwara
Kris Hinchley
John Fox
Jeff Farnell
Jimmy Sullivan
Khara Williams
Tarrance Williams
David Way
Mike McNulty
Neil Pedersen

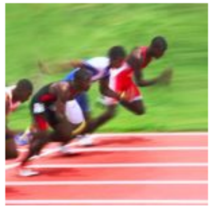
National Champion
Nick Kuczwara
Dan Palmer

HC Football
Preston Letts
Mike Mangan
Brian Grzelakowski
Brian Griffin
Rob Anderson

www.trackfootballconsortium.com



Rebuilding a Track Program



All coaches need to start somewhere. In this article, Coach Jeff White explains how he rebuilt a school's track program when he had little of his own experience to rely on. With help from Twitter and Google, books and articles, and other coaches, he was able to build his track team into county champions, with individuals placing at the state level. Here are his recommendations for other coaches, both novice and experienced.

Filed Under: Blog

The 4.4 40

Claims of 4.4 40s by runners as young as 15 or 16 seem considerably exaggerated. Timing methods are partly to blame. Several variables also have an impact. For best results, electronic start and finish is best.

Filed Under: Blog
Tagged With: 40 Yard Dash

Improving the Start Block: A Case Study

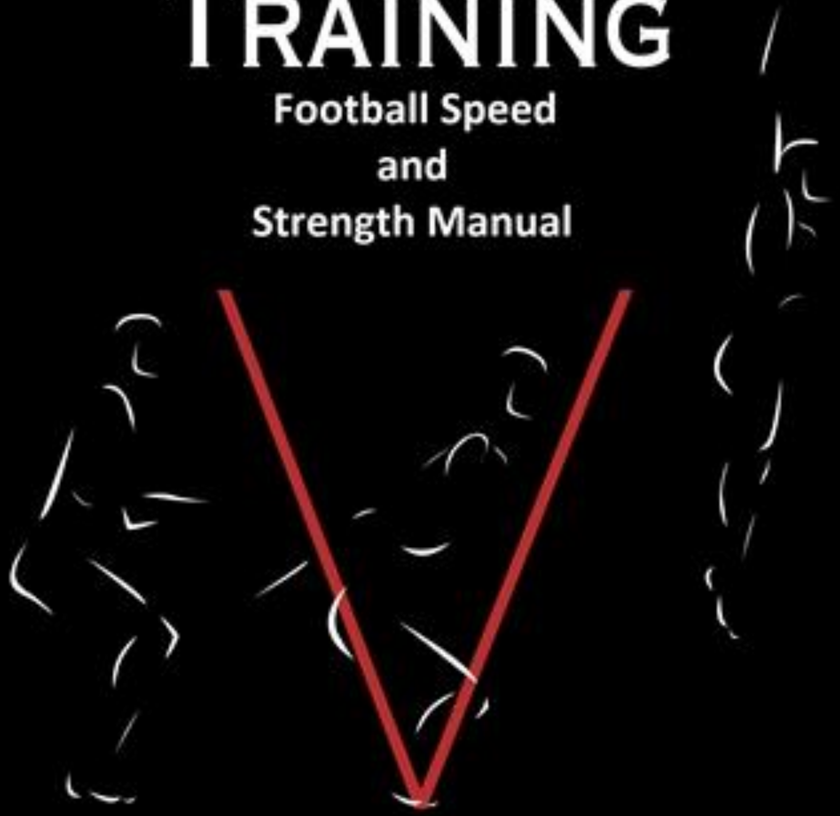
It may be best to understand and train your sprinter's individual challenges in the start block than to train their technique to look picture perfect.

Track Football Consortium VIII

- Dec. 8-9
- Benedictine University, Lisle IL
- www.trackfootballconsortium.com

TRIPHASIC TRAINING

Football Speed and Strength Manual



Written By Chris Korfist and Cal Dietz

4x100 Relay
42.39 average in 14 years

- 18- 42.2 Montini
- 17- 42.4 Montini
- 16-42.3 Montini
- 15- 42.6 Montini
- 14-41.48 York
- 13-42.54 York
- 12-43.1 York
- 11-42.26 York
- 10- 42.47 York
- 09-41.69 York
- 08- 42.03 York
- 07- 42.8 York
- 06- 42.95 York
- 05- 43.0 Downers Grove
- 04- 42.48 Hinsdale Central
- 03- 42.23 Hinsdale Central

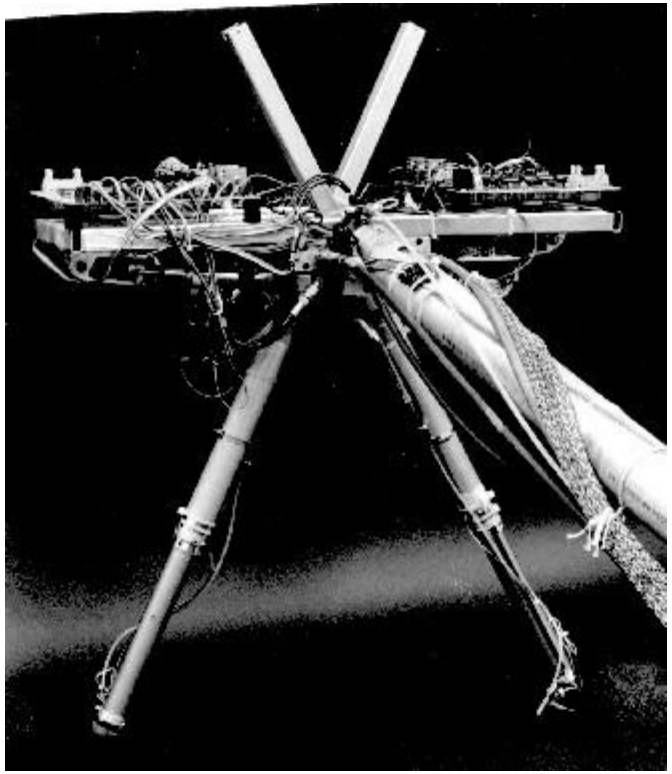
100m best
10.85 Average over 14 years

- 18-10.80
- 17-10.64
- 16-10.72
- 15- 10.50
- 14- 10.83
- 13-10.92
- 12-11.1
- 11-11.11
- 10- 10.96
- 09- 10.73
- 08- 10.92
- 07– 10.84
- 06- 10.80
- 05- 11.1
- 04- 10.5
- 03- 10.9

Clark Pic


JUST FLY PERFORMANCE PODCAST
KEN CLARK
SIMPLIFASTER
TECHNOLOGY FOR ATHLETIC SPEED DEVELOPMENT

MIT's Planar Bipedal robot
5.9 m/s



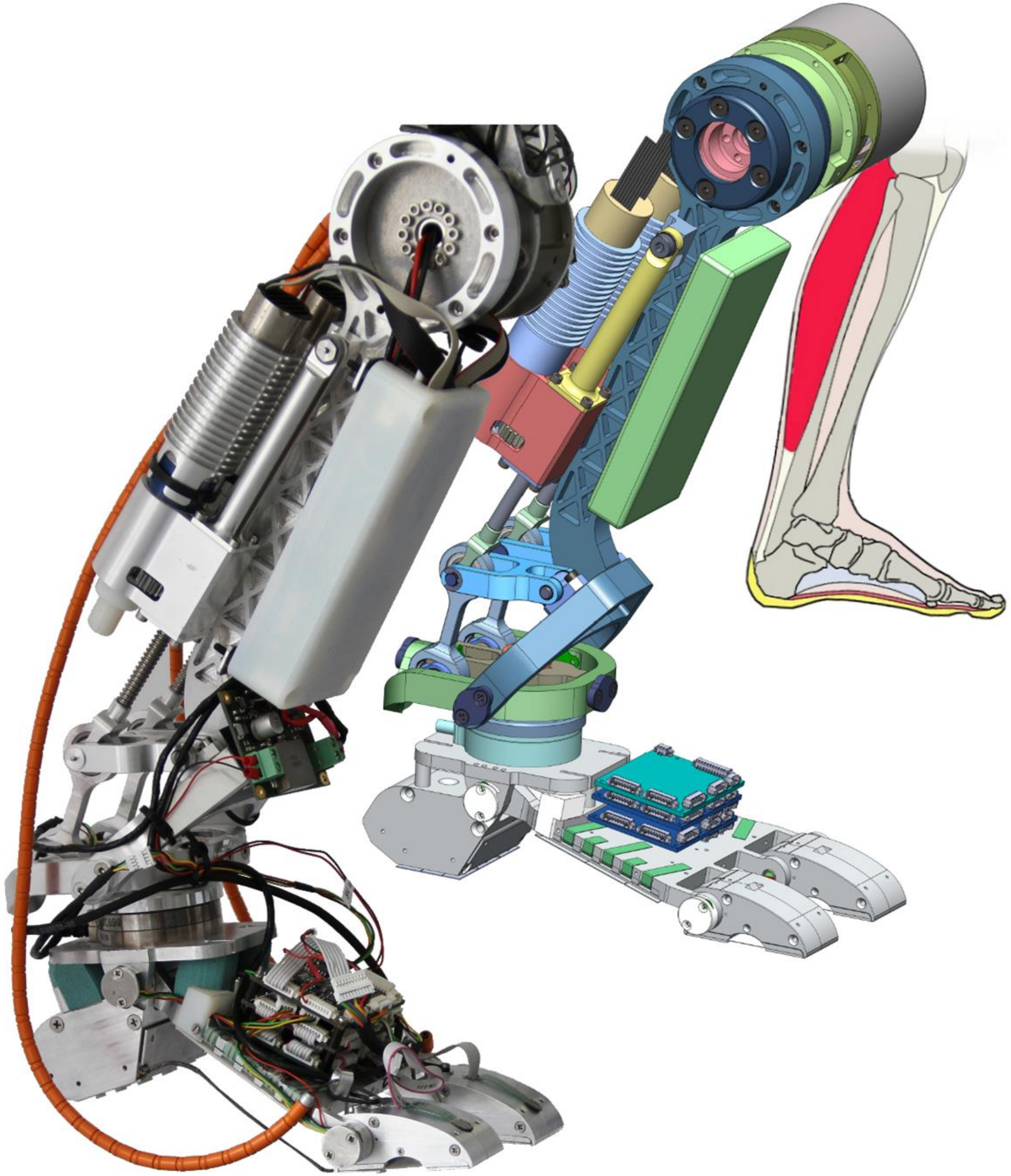
MABEL 6.8 mph

Boston Dynamics

Here's the gold…

- If the power is the limitation, then at max velocity, the drag force cancels the thrust force, leaving no thrust to accelerate the system. If the limitation is strength, then at maximum speed the loading on some components equals its strength, and any increase in speed would cause it to break. If the limitation is stability, then at the max speed, some equilibrating mechanisms is at the stability limit, and at a higher speed the system would tumble out of control.

- How Fast Can a Robot Run, Jeff Koechling

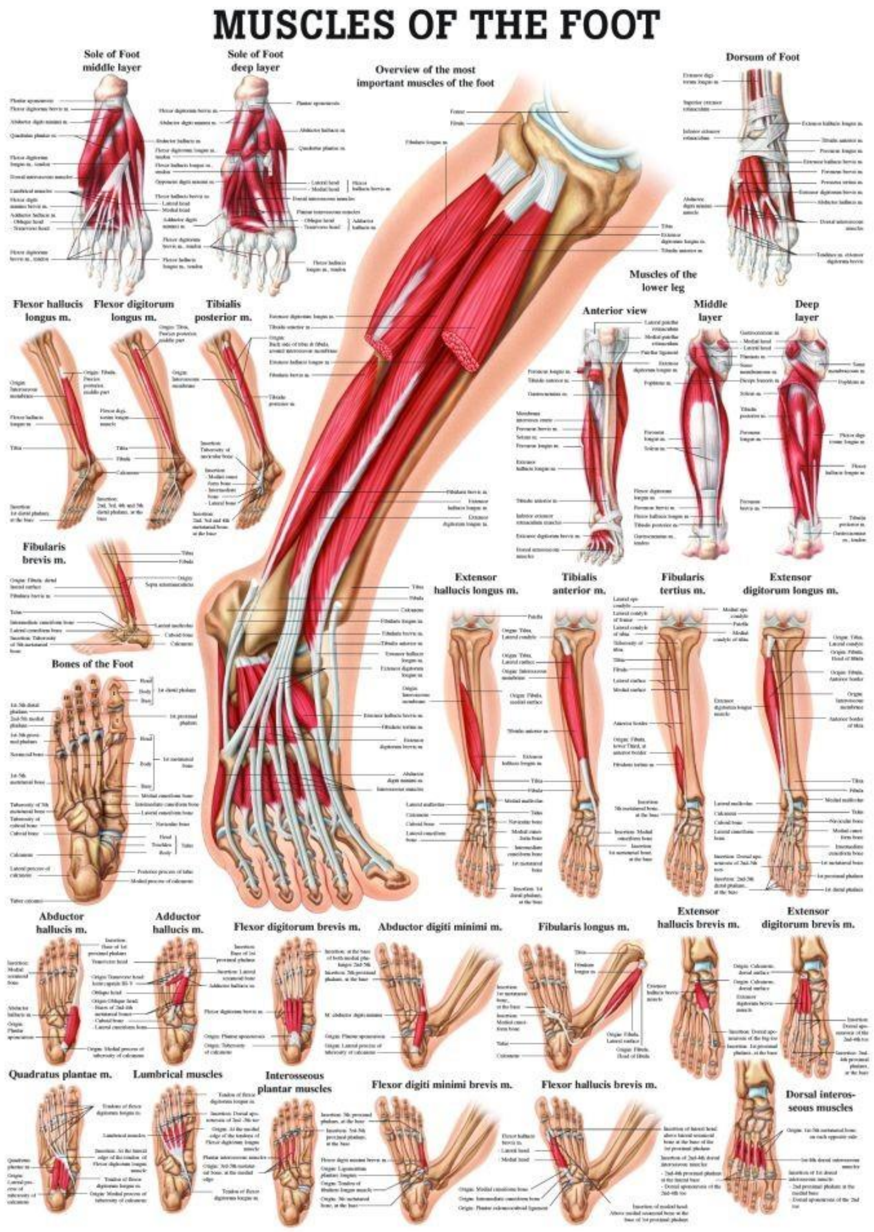



SHORT ACHILLES - RAPID ENERGY
ABSORPTION AND RELEASE

Invert

Evert

Pronate



Supinate

Varus

Valgus

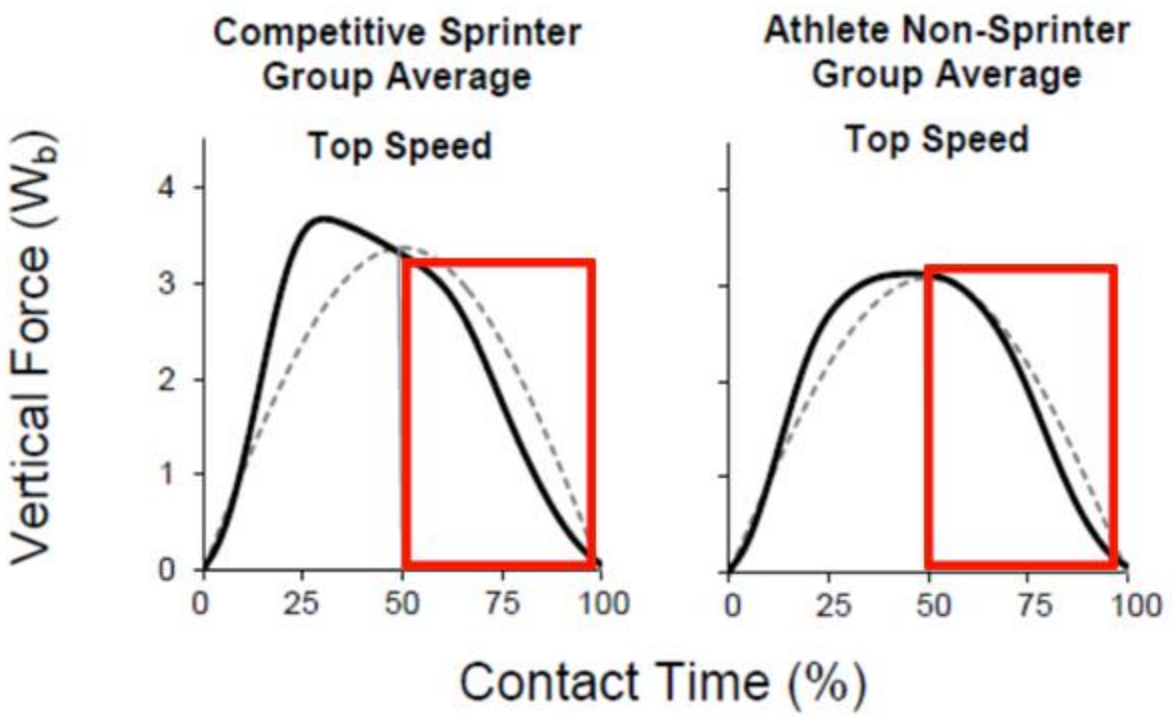
Speed Profiles for Male Sprinters

A little extra force = a lot of extra speed!

Below Average	Good	National-Class	World-Class
Top Speed: 9.0 m/s	Top Speed: 10.0 m/s	Top Speed: 11.0 m/s	Top Speed: 12.0 m/s
10m Fly Time: 1.10 s	10m Fly Time: 1.00 s	10m Fly Time: 0.91 s	10m Fly Time: 0.83 s
Contact Time: 0.110 s	Contact Time: 0.100 s	Contact Time: 0.091 s	Contact Time: 0.083 s
Average Force: 380 lbs.	Average Force: 400 lbs.	Average Force: 420 lbs.	Average Force: 440 lbs.

Data based on competition values for athlete that is 5’10”, 180 lbs.

Forces in second half of contact are ~same

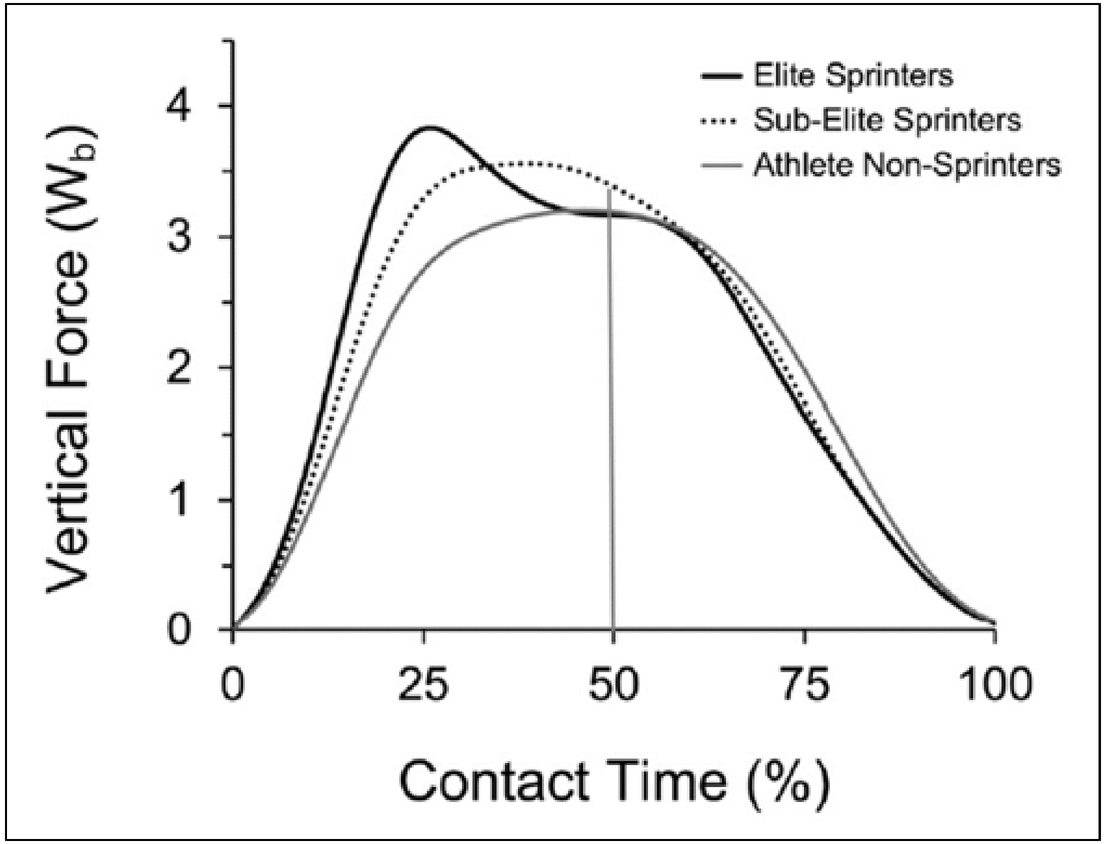


Clark & Weyand (2014)

TFC

The Force Signature for Speed

The difference separating sub-elites from *elites*:



TFC

Understanding the effect of Touchdown distance and ankle joint kinematics on sprint acceleration performance through computer simulation, Bezodis, N., Sports Biomechanics, (2015)

- “Beneficial effects of reducing ankle joint dorsiflexion during early stance on early acceleration performance and identified the need for coaches to increase ankle plantar flexor strength…”

- Slightly greater than 90 degrees

THE FOOT

- CONTACT- The stiffer the ankle complex is at contact, the more energy can be transferred up and down the line

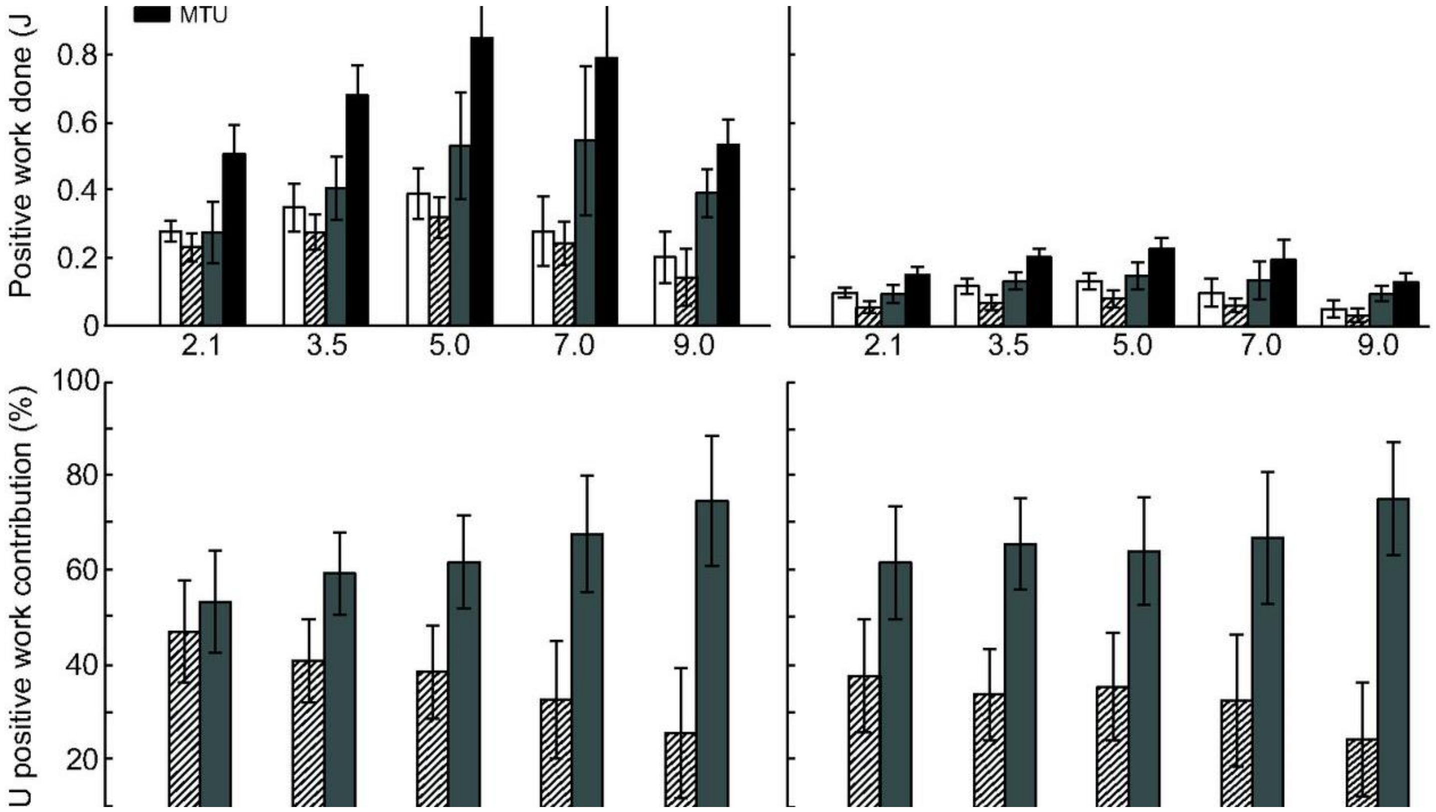
- For example, poor big toe function will dissipate 34% of the energy that the foot/ankle complex absorbs which is about 75% of the total energy in a sprint

Tendon elastic energy in the human ankle plantar-flexors and its role with increased running speed

Adrian Lai, Anthony, Schache, J of Experimental Biology, 2014

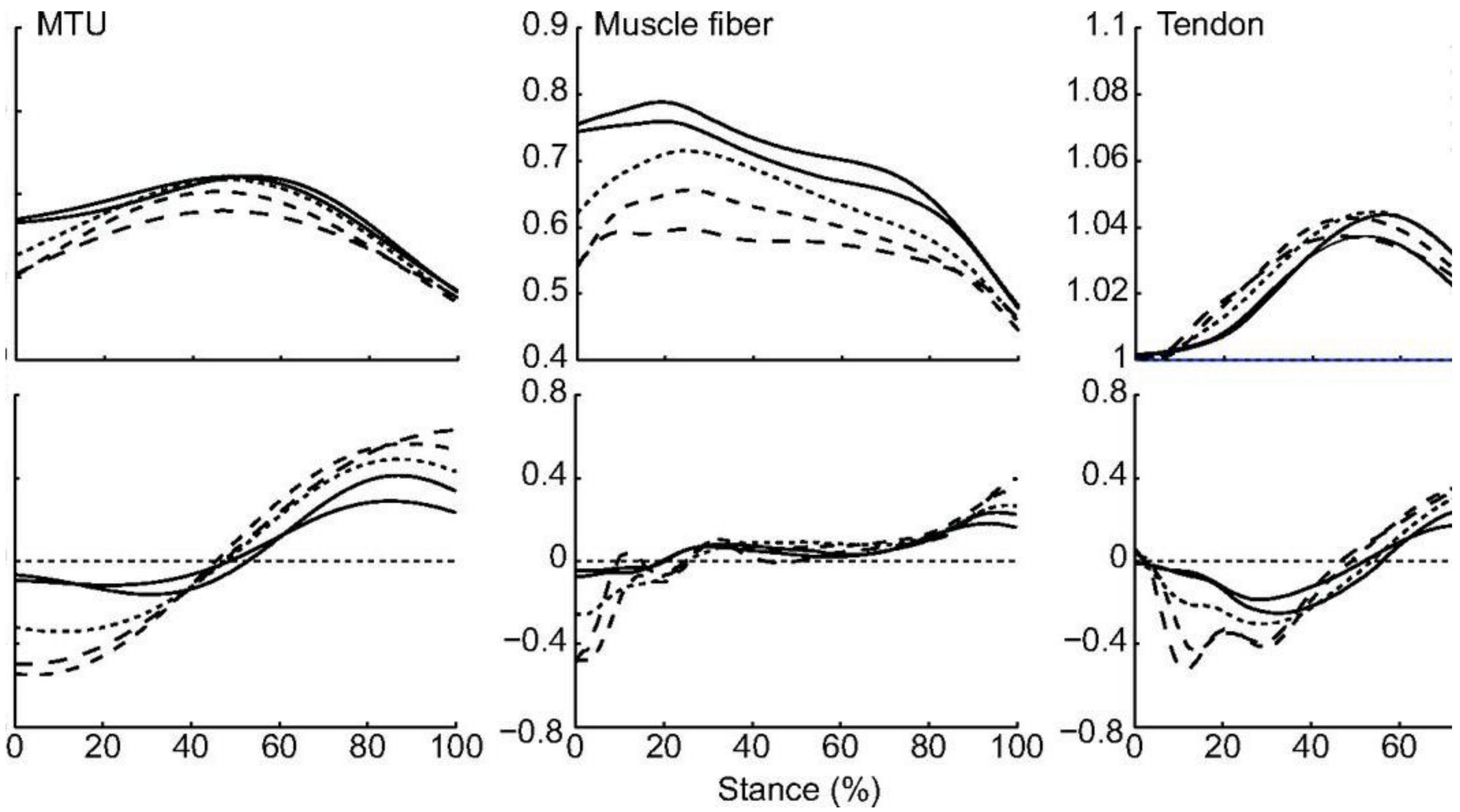
- MTU of gastroc and soleus was responsible for 75% of positive work at 8 m/s

Muscles in Isometric state and MTU active



White muscle fiber stripe fiber with mTU grey tendon black MTU

Muscle length changes with velocity



Top normalized length bottom contraction velocity shows as speed picks up- more MTU and Tendon over muscle- big calf distance runner

- "…tendon elastic strain energy to provide a greater relative contribution than muscle fiber work to the positive work done by the Muscle tendon Unit with increasing running speed. The increased utilization of tendon elastic strain energy with faster running was facilitated by larger activation levels and a relatively isometric muscle fiber behavior. Storage and recovery of tendons elastic strain energy in the human ankle plantar-flexors enhances muscle performance and is likely integral to achieving maximum sprinting speeds."

Dynamic contribution analysis on the propulsion mechanism of sprinters during initial acceleration phase, Koike, S., 33rd International conference on Biomechanics in sport, 7/15

- Ankle dorsiflexion torque was the largest contributor to the generation or whole body propulsion

Ankle/foot

- “the push-off includes one major joint action- Ankle joint extension. The greater the ankle joint extension , the greater the driving force can be generated. ..The knee joint does 31 joules of work, the plantar flexors do 192 joules..”
- Explosive Running, Michael Yessis

Support leg joint contributions to center of mass acceleration during 3 phases of a maximal sprint, von Lieres, H. conference paper

- MTP (metatarsal phalangeal joint) and ankle showed the largest contributions to vertical and horizontal acceleration

When account for MPJ…

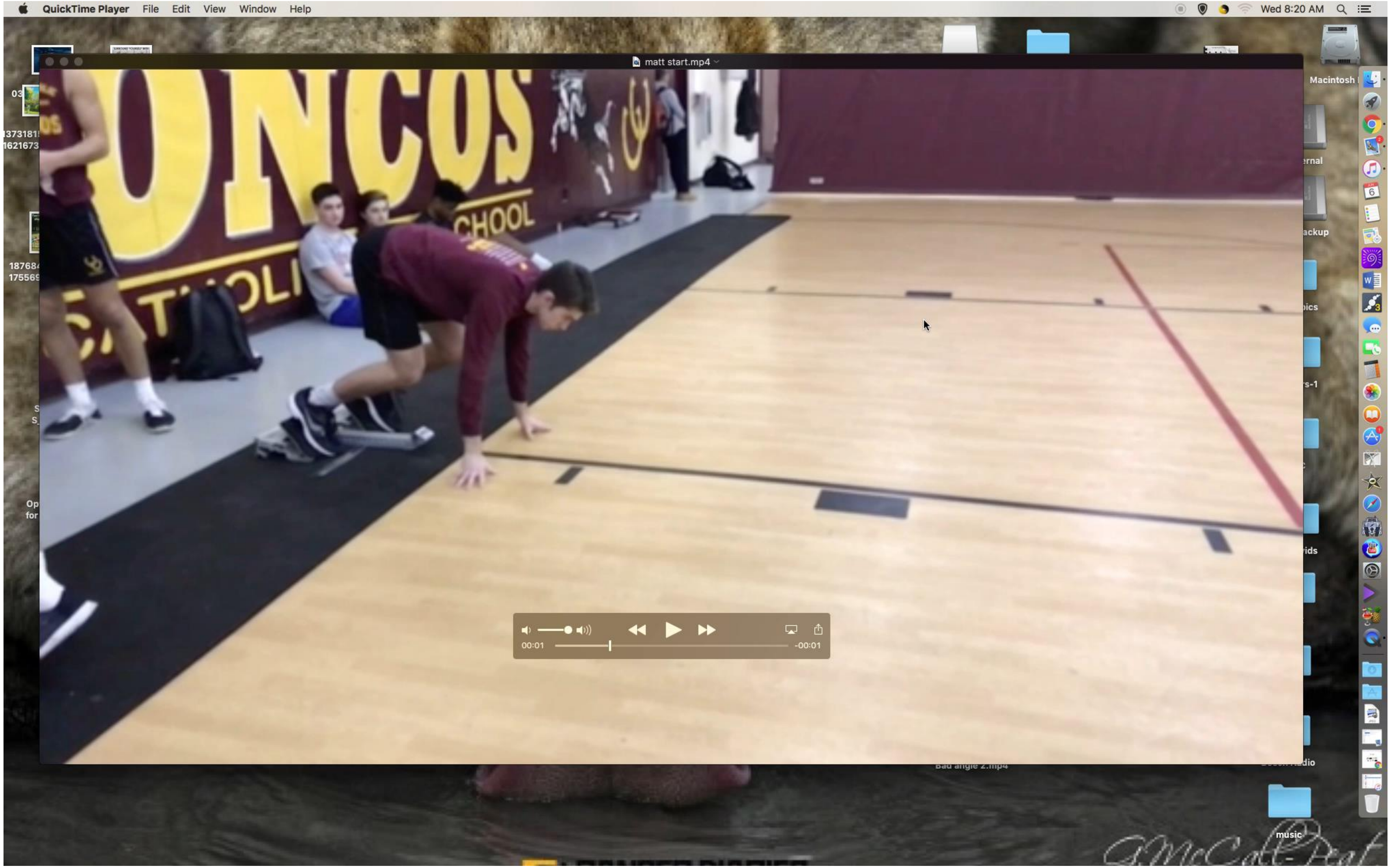
- Ankle- 35% higher
- Knee- 40% lower
- Hip- 9% higher

So why not popular?

Which logo do you want on your shirt?

BENCH PRESS 300 CLUB

Isometric Plantar flexion club for 700 N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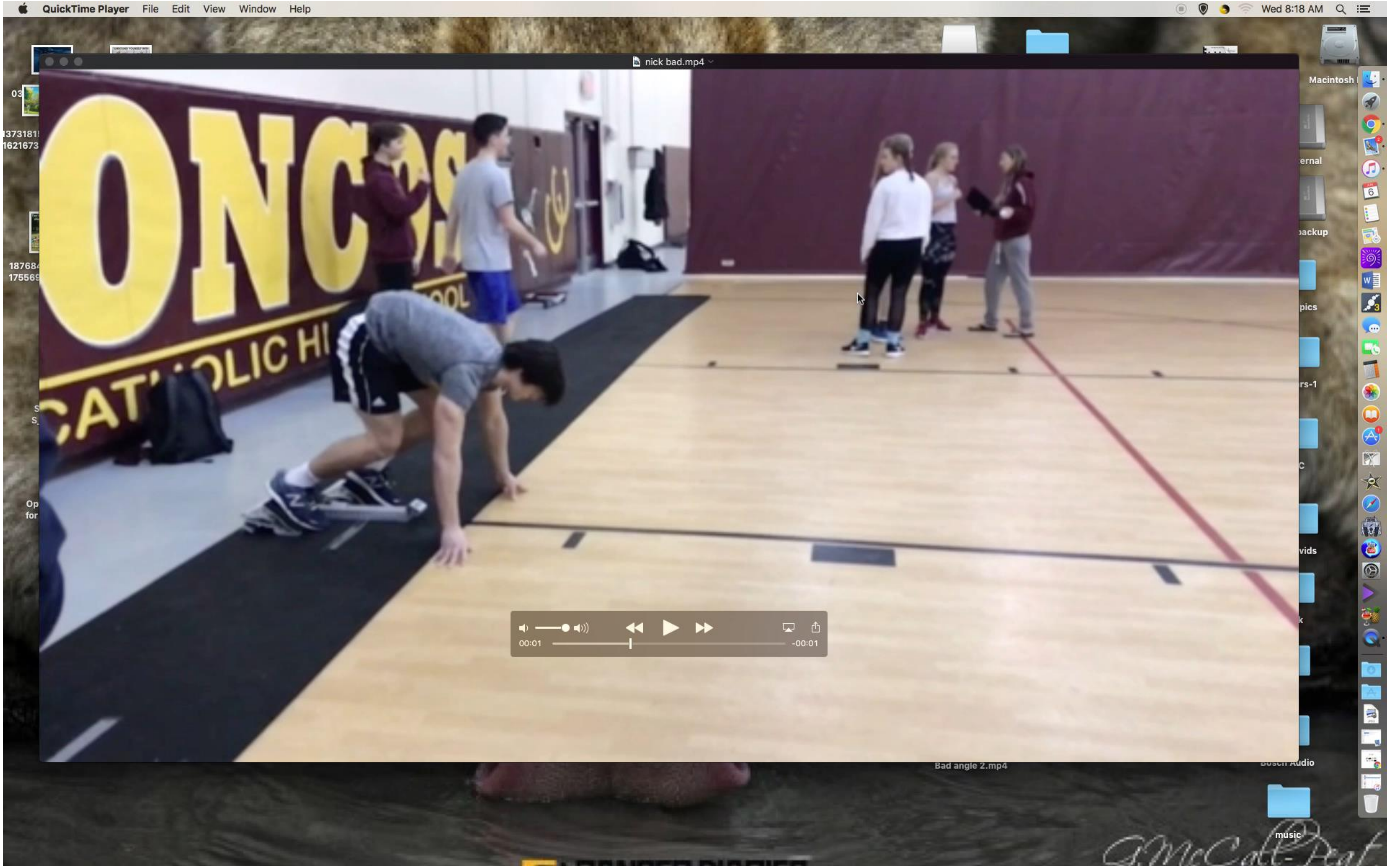
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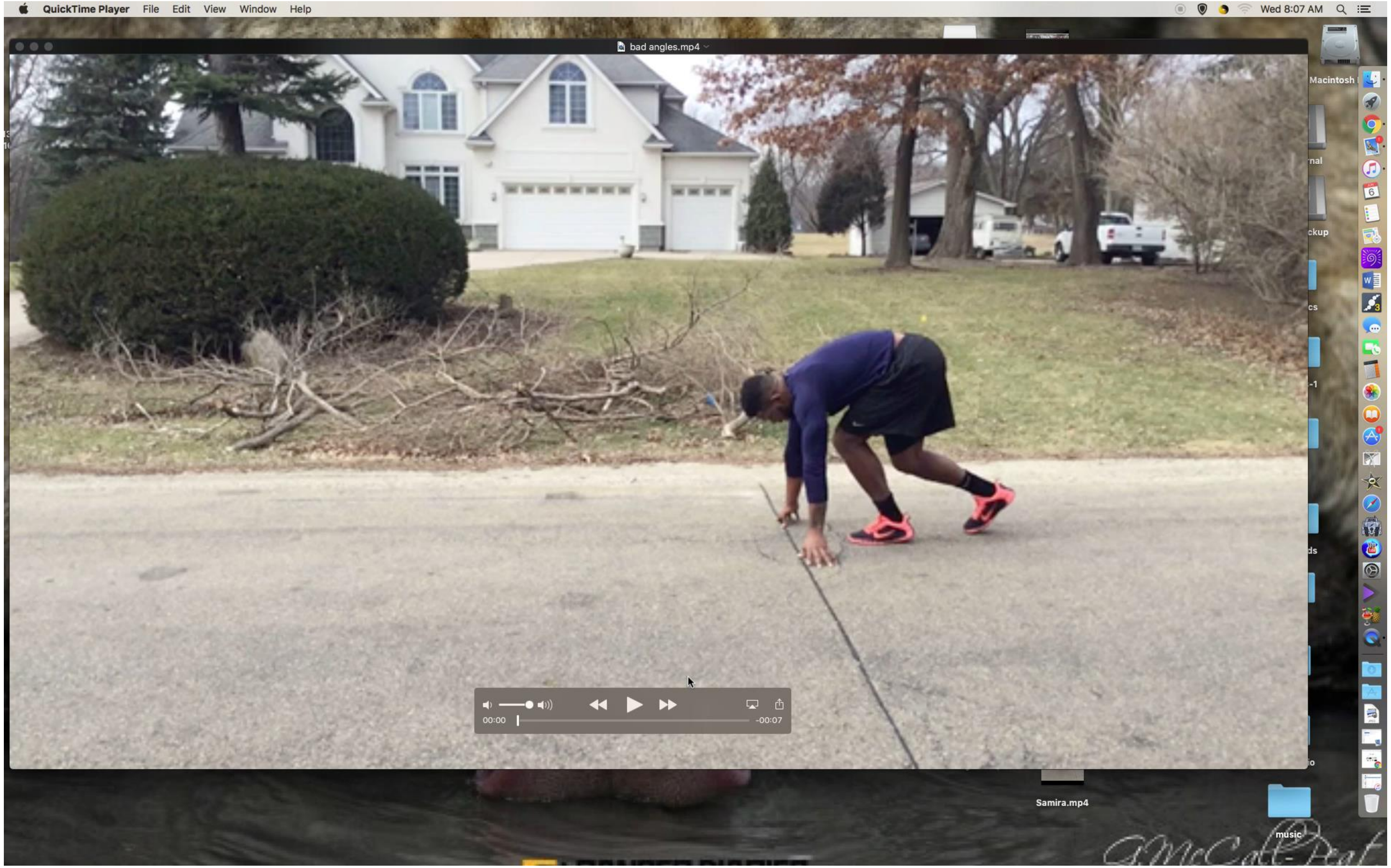
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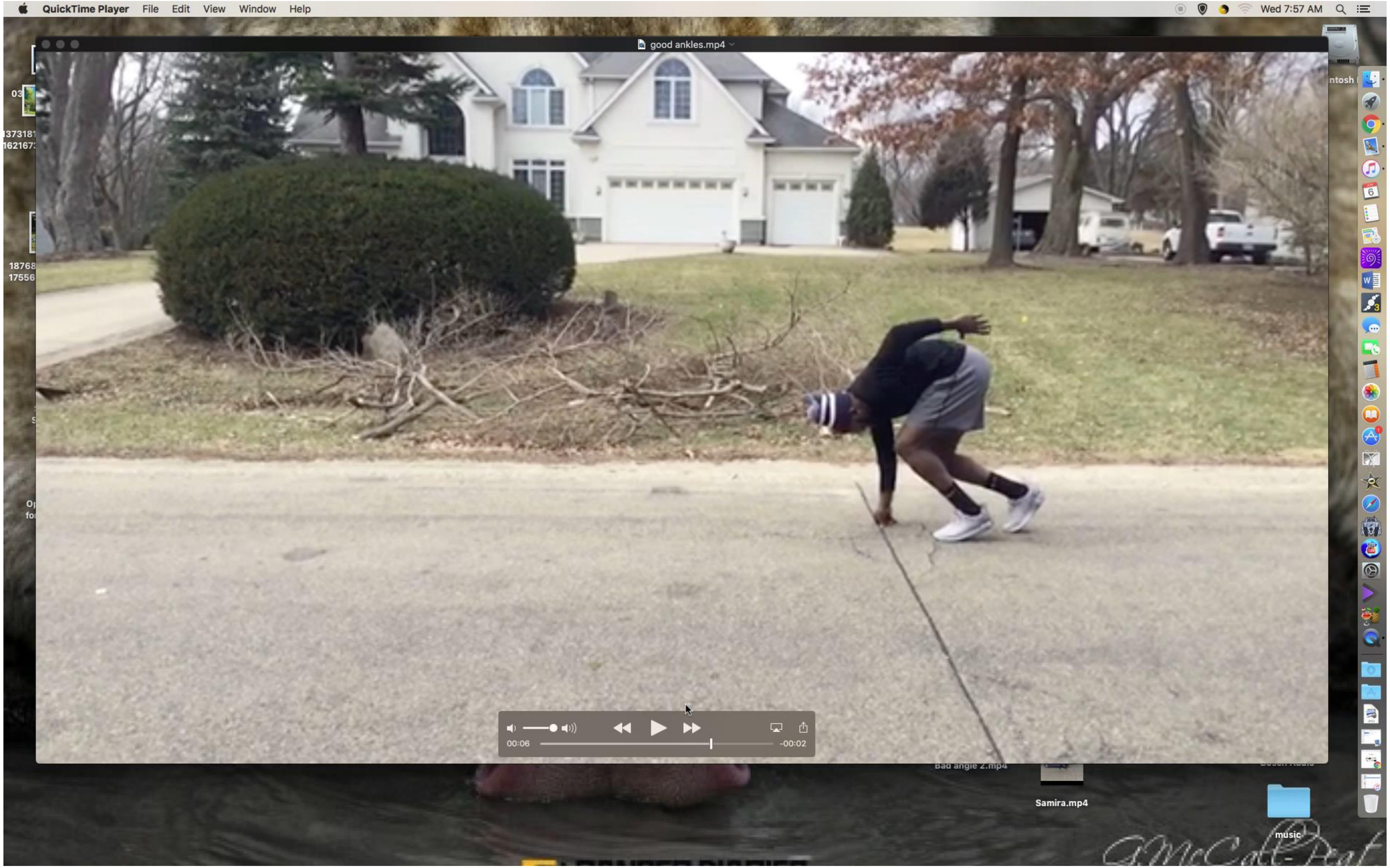
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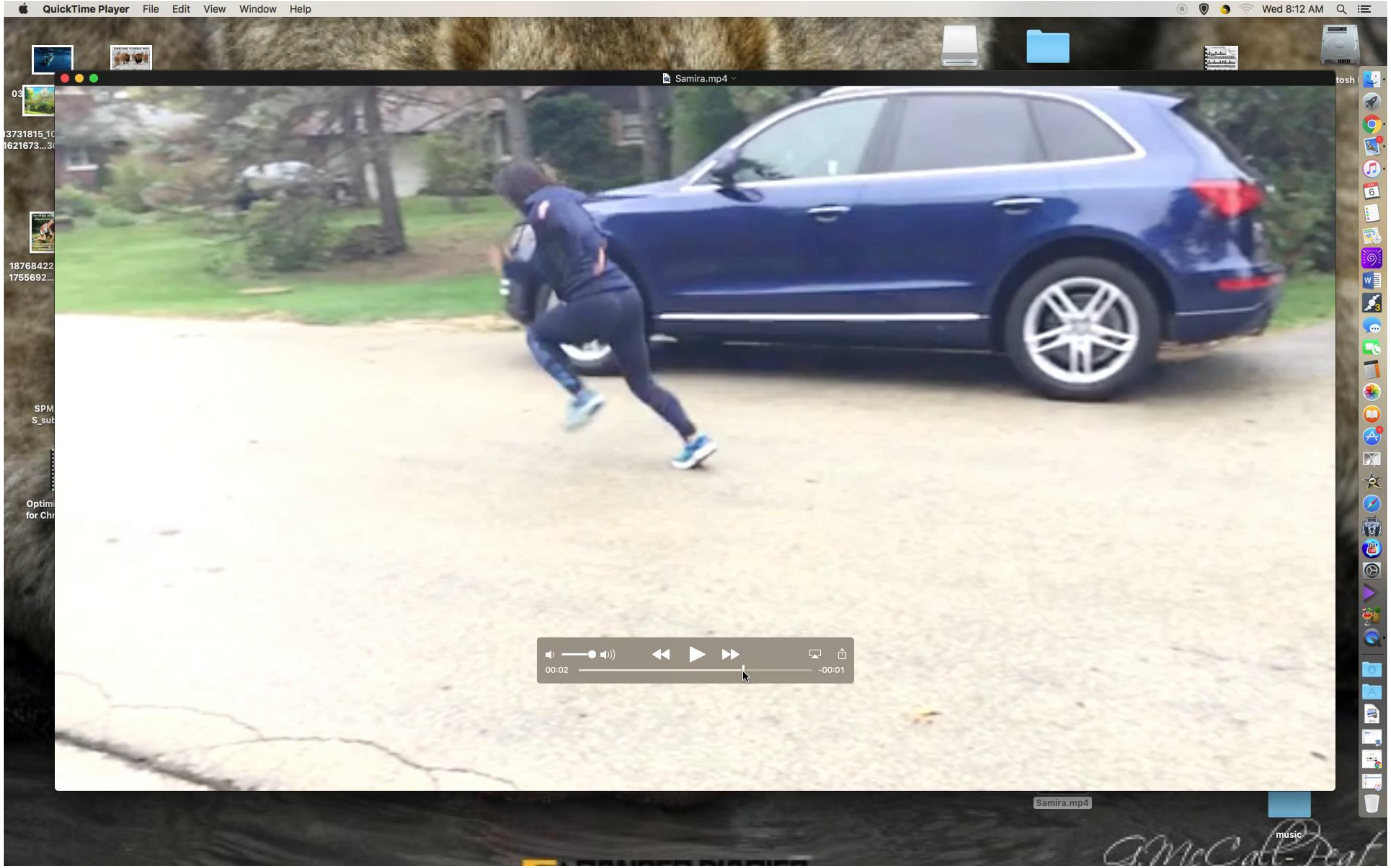
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Samira.mp4
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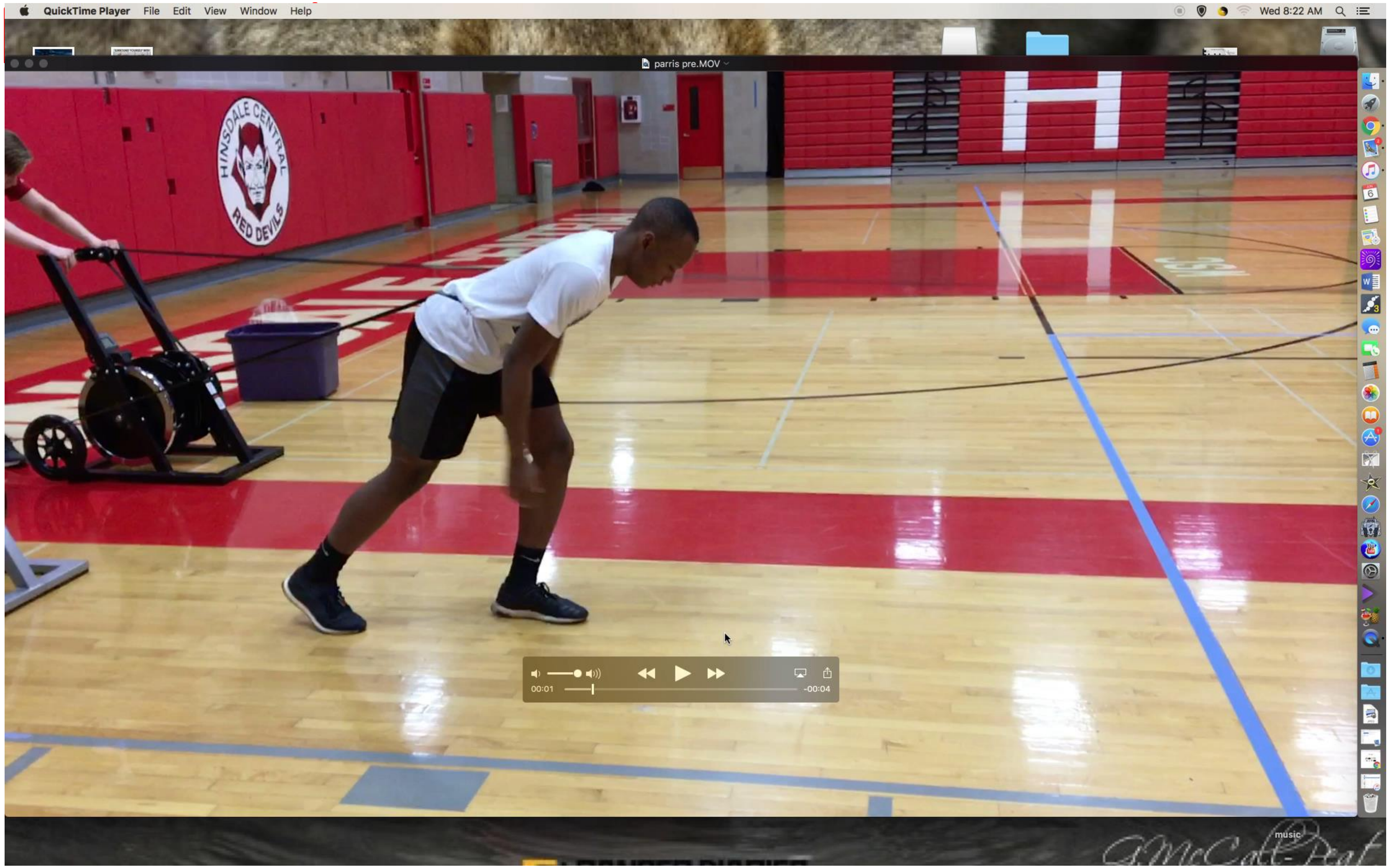
BOYS VOLLEYBALL
WEST SUBURBAN CONFERENCE TITLES
STATE FINISHES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parris pre.MOV
HINSDALE CENTRAL
RED DEVILS
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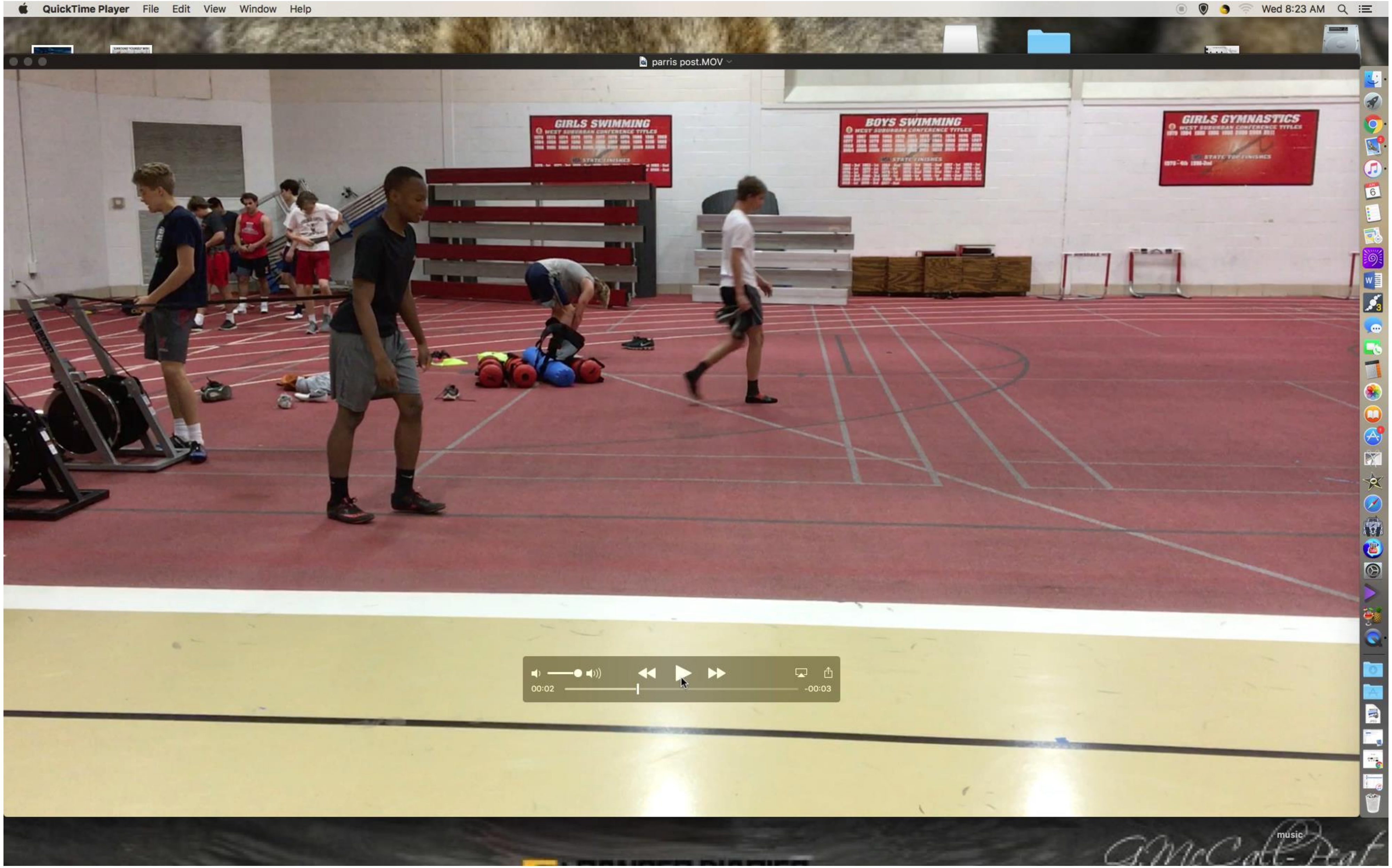
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Wed 8:23 AM
parris post.MOV
GIRLS SWIMMING
WEST SUBURBAN CONFERENCE TITLES
BOYS SWIMMING
WEST SUBURBAN CONFERENCE TITLES
GIRLS GYMNASTICS
00:02
-00:03
music

Why we train Isometrics and feet first

- Fatigue the tendon, forces more MTU
- Always blow them off if they are last

Human tendon adaption in response to mechanical loading. A review

Sebastain Bohm, J of Sports Medicine (2015)

- Joint angles are important
- Type of contraction (ecc,iso or conc) not matter, but high intensity important
- Plyometrics had little impact on tendon response

Lower extremity stiffness, Brazier, J., Journal of Strength and Conditioning, 10/17

- Iso training is the best for tendon change

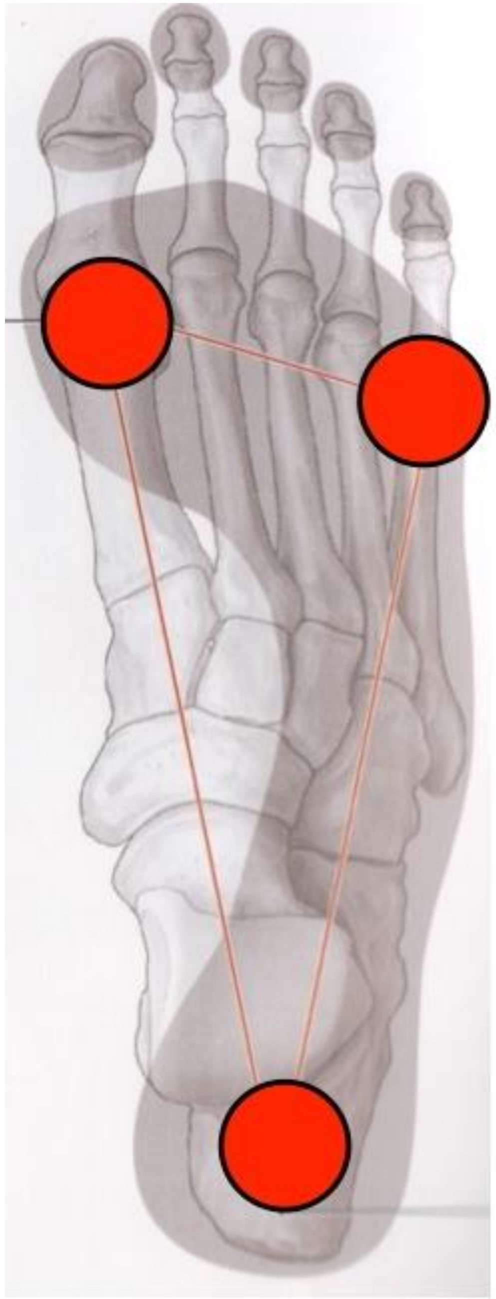
Let’s move…

- Stand up
- Go into a calf raise
- Which way does your foot break
    - Over 4 toes?
    - Big toe?

Good foot/bad foot

Can you?

- 1. Stand on 2 feet with pressure on your tripod?
- 2. Do the same on one foot?
- 3. Pull your toes off the ground and balance?
- 4. Close your eyes? Ears?
- 5.Ankle squat and hold that foot position?
- 6. Go up on your big toe



ISO foot patterns

- ISO Position has a 15 degree carryover in each direction

- Knee straight
- Knee bent
- Big toe

- Hip position and placement of weight key


DRI-FIT

ISO foot patterns in exercises

- Split squat
- Toe off/with


REC
VS
SLO-MO
CLEAR

The anatomical arrangement of muscle and tendon enhances limb versatility and locomotor performance, Wilson, A., Philosphical transcations of the Royal Society, (2011)

- Tendon stiffness is tuned to optimize fiber shortening velocity and minimize muscle activation
- To role of distal muscles may therefore not be to directly perform work but to modulate the power production of proximal muscles by functioning as a tuneable series of elasticity or tendon-Cocontractions

Stumble reflex

- ”At the spinal cord level, there is a coupling between muscle and its antagonist (and an inhibition of one another).” Both in a trip or gait.
-

Stumbling corrective reaction: a phase-dependent compensatory reaction during locomotion.

Forssberg H., 1979

- Tripping cats
- Perturbations in the stumble reflex cycle cause ”brisker flexion”
- Making your body think it is going to fall or trip will trick it into tensing

- Body organization: The goal the body has is to organize its parts to do the task that has been set out. In an athletic sense, this would incorporate navigation, slack control with co-contractions and a target. In order to challenge this process, we can make things happen faster so body has to prepare faster or fall (managing reflexes). When challenged the body will learn to stiffen faster to prepare for the unexpected. This translates to the actual movement because the body will find that it works better when it is stiffer and stable.

SO……..

- Overspeed works because it forces a stiffer spring (which results in higher Ground Reactionary Force) in a manner that the body accepts and assilimilates due to stumble reflexes and motor learning skill development.

Even cooler thought of the day…

- The peak forces that occur in a reflexive support during sprinting , such as stumble and crossed extensor, are greater than those that can be created by “maximum voluntary contraction”.
- Kyrolainen, H. et al. Changes in muscle activity with increased running speed” J. of Sports Sciences, 2005

Overspeed

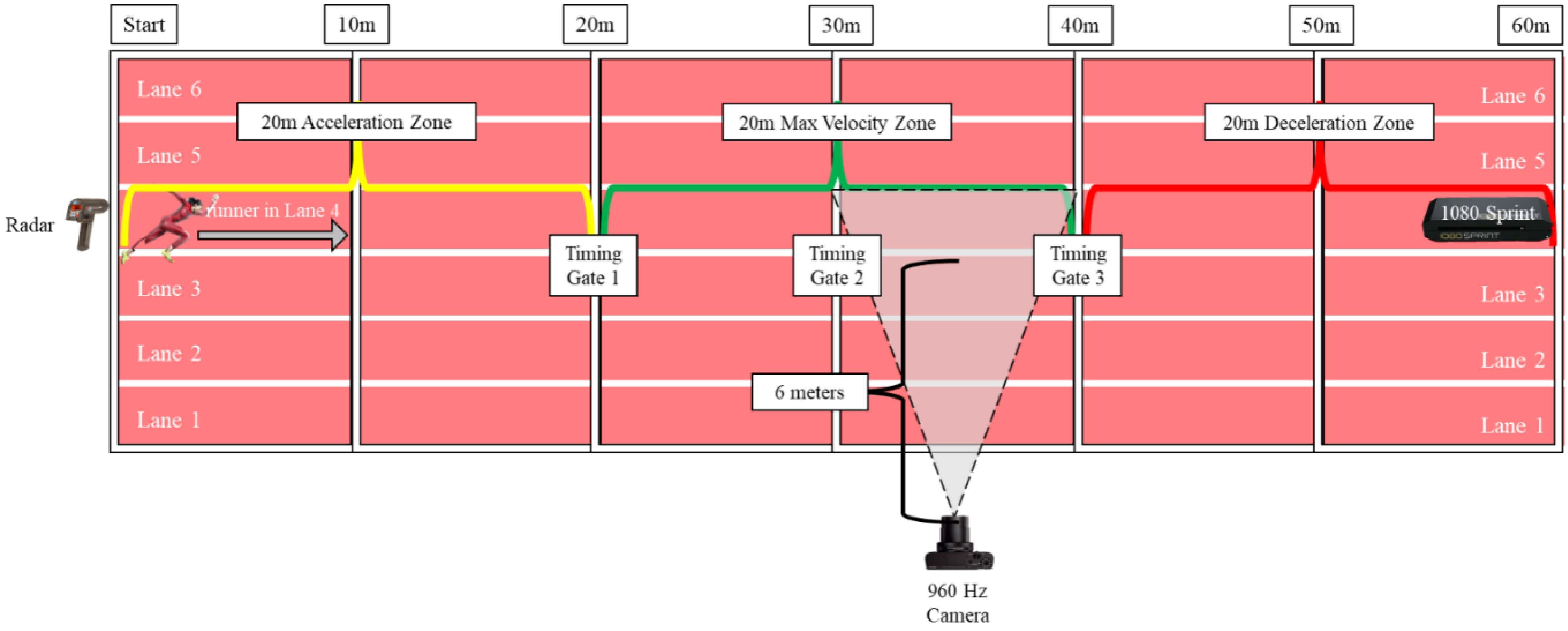
- Bands
- Unweighted
- Tows
- Elevated surfaces


SHUTTLE
45

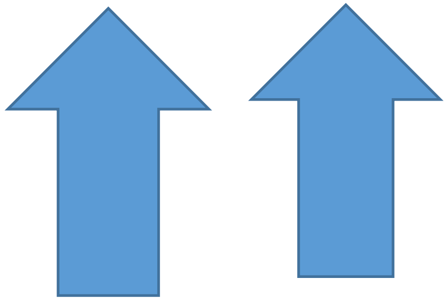
The Acute Kinematic Effects of Sprinting with Motorized Assistance

Kenneth Clark, Micheal Cahill, Christian Korfist

- Theory: assisted sprinting could acutely enhance maximum velocity via mechanisms normally observed with swifter running, and without causing aberrant changes to the runner's gait, this mode of training may have potential to elicit long term improvements in top speed.
- -assisted max velocity would increase due to stride length rather than rate
- - assisted run would have decreased contact times and increased measure of vertical force but no appreciable changes in flight times, swing times or contact lengths


Start
10m
20m
30m
40m
50m
60m
Lane 6
Lane 5
Lane 3
Lane 2
Lane 1
20m Acceleration Zone
20m Max Velocity Zone
20m Deceleration Zone
Radar
runner in Lane 4
Timing Gate 1
Timing Gate 2
Timing Gate 3
1080 Sprint
6 meters
960 Hz Camera

Velocity (m/s)	Contact Time (s)	Flight Time (s)	Step Time (s)	Swing Time (s)	Step Rate (Hz)	Step Length (m)	Contact Length (m)	Flight Length (m)	Vertical Force (BW)	
Unassisted Mean	10.0	0.100	0.112	0.213	0.325	4.72	2.11	1.00	1.12	2.13
Unassisted SD	0.3	0.011	0.007	0.013	0.018	0.29	0.09	0.09	0.06	0.14
Assisted Mean	10.9*	0.095*	0.116†	0.211	0.328	4.75	2.30*	1.03*	1.26*	2.24*
Assisted SD	0.4	0.010	0.006	0.014	0.019	0.32	0.09	0.09	0.05	0.13
% Difference	9.4%	-5.2%	3.4%	-0.6%	0.8%	0.7%	8.7%	3.7%	13.1%	4.8%
Effect Size *(interpretation)*	3.28 *(v. large)*	0.49 *(small)*	0.58 *(small)*	0.10 *(trivial)*	0.15 *(trivial)*	0.11 *(trivial)*	2.04 *(v. large)*	0.40 *(small)*	2.62 *(v. large)*	0.76 *(moderate)*



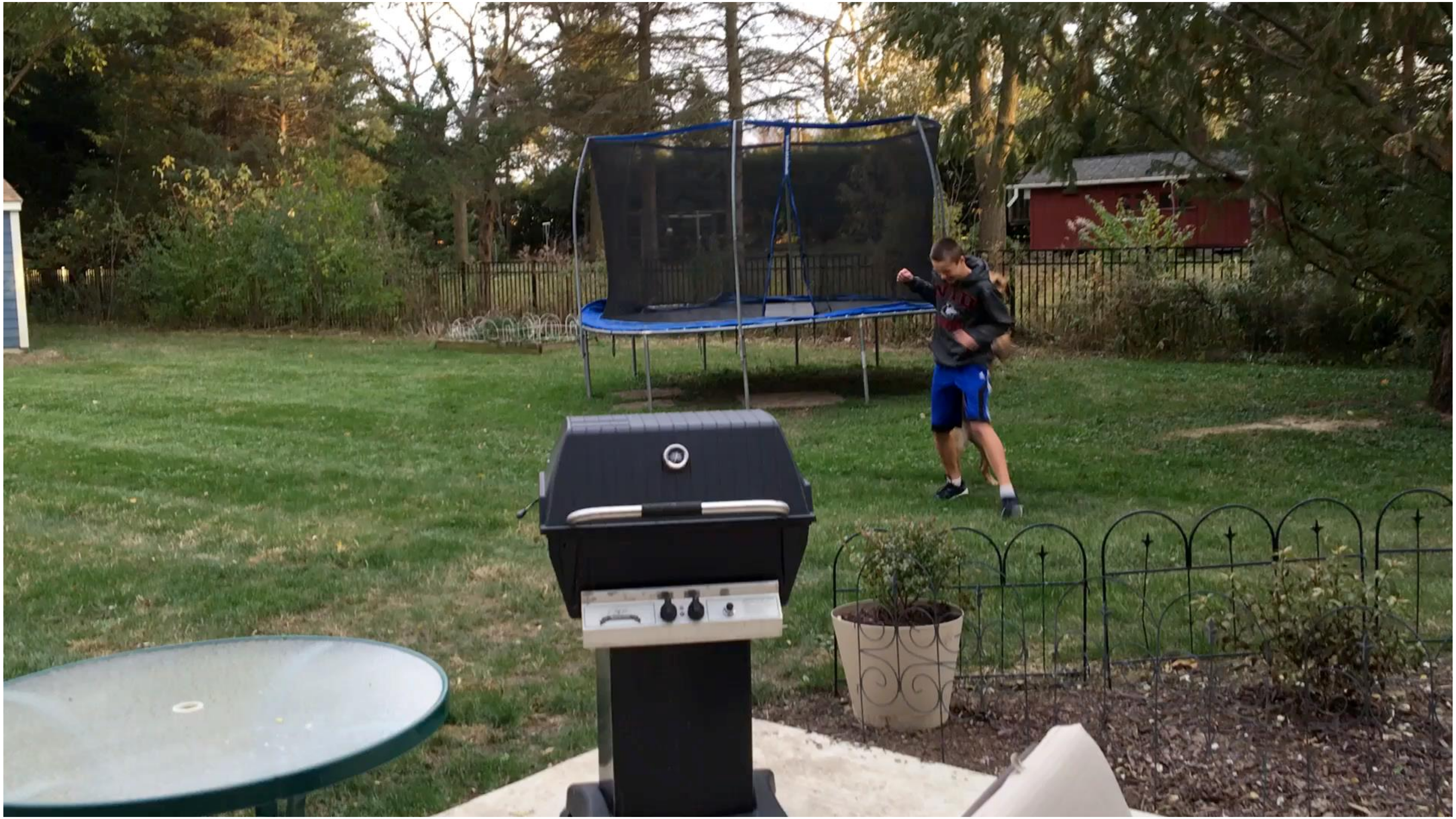
[redacted]

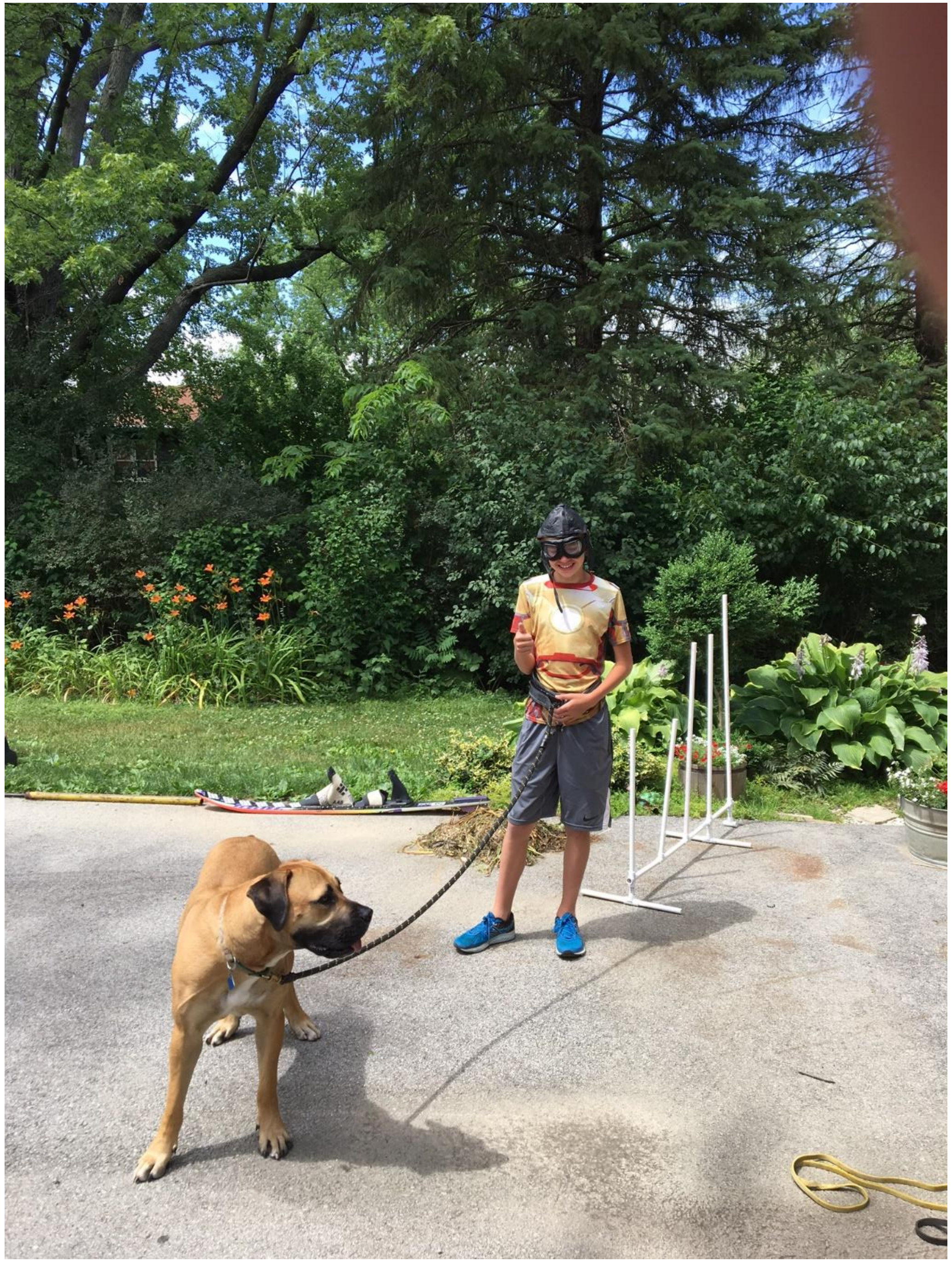
- Faster max velocities were achieved due to increased stride length and improved vertical forces

  - Shows minimal changes in contact times and postural changes
  - Mean vertical forces was larger when towed than when unassisted

Conclusion

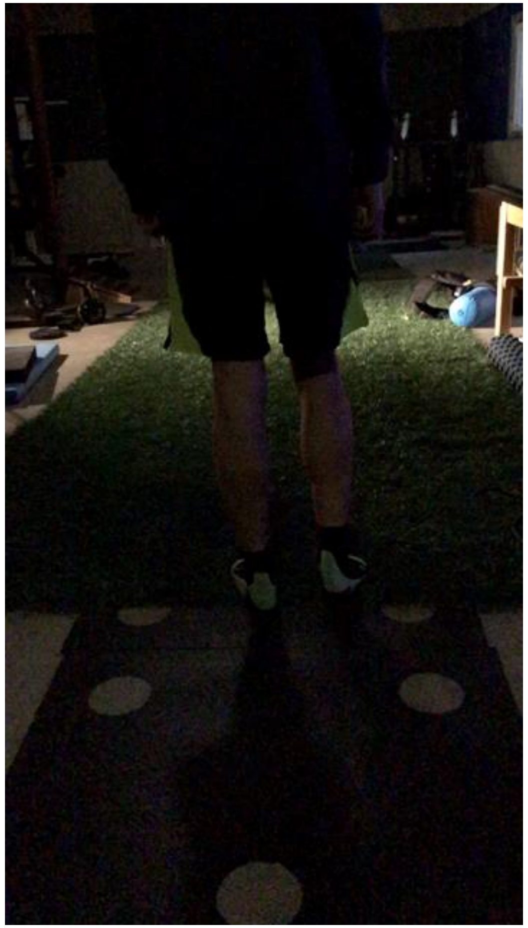
- Although step rate did not change, there were small but significant decreases in contact time, indicating ***increased vertical force*** and decreased duty factor ratio during the assisted conditions. This is consistent with normal mechanics of increased max velocity,





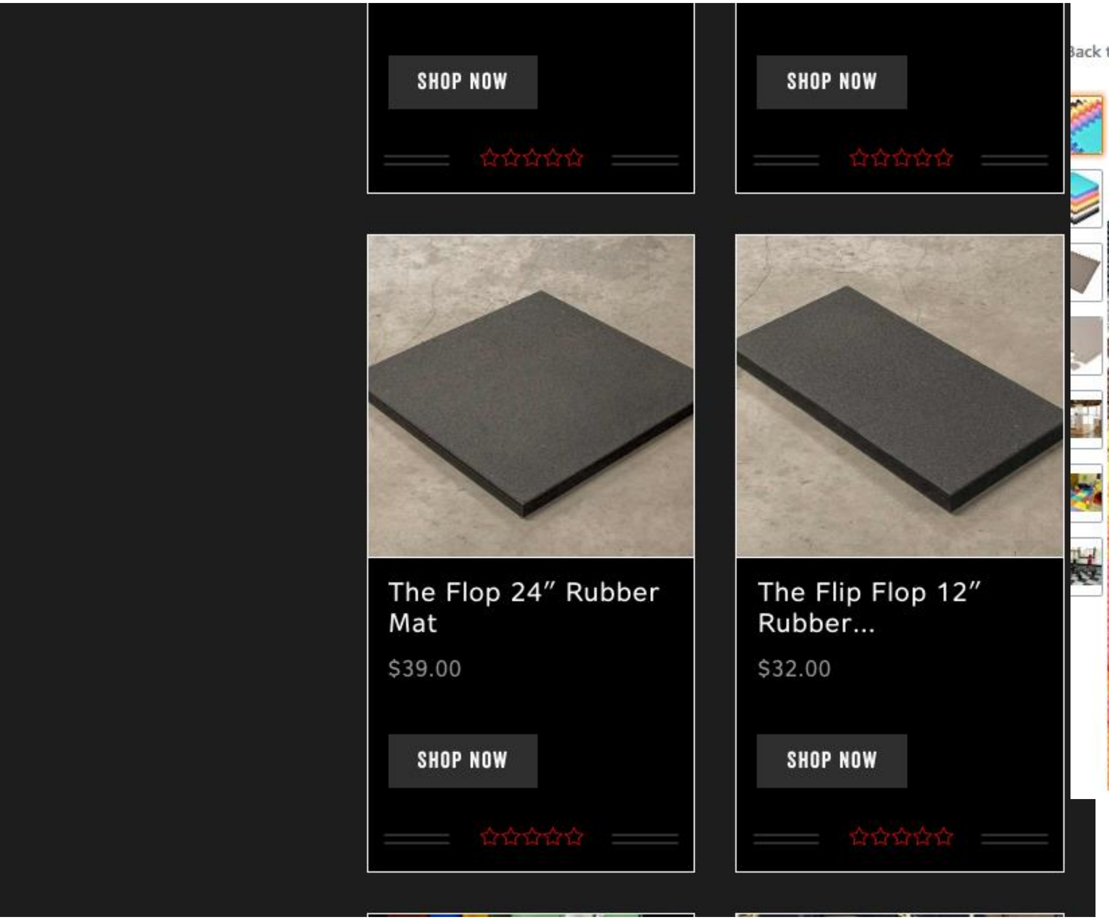
Toe pop exercises

- Needs to be alternating or else no stumble reflex and becomes bag hop exercises

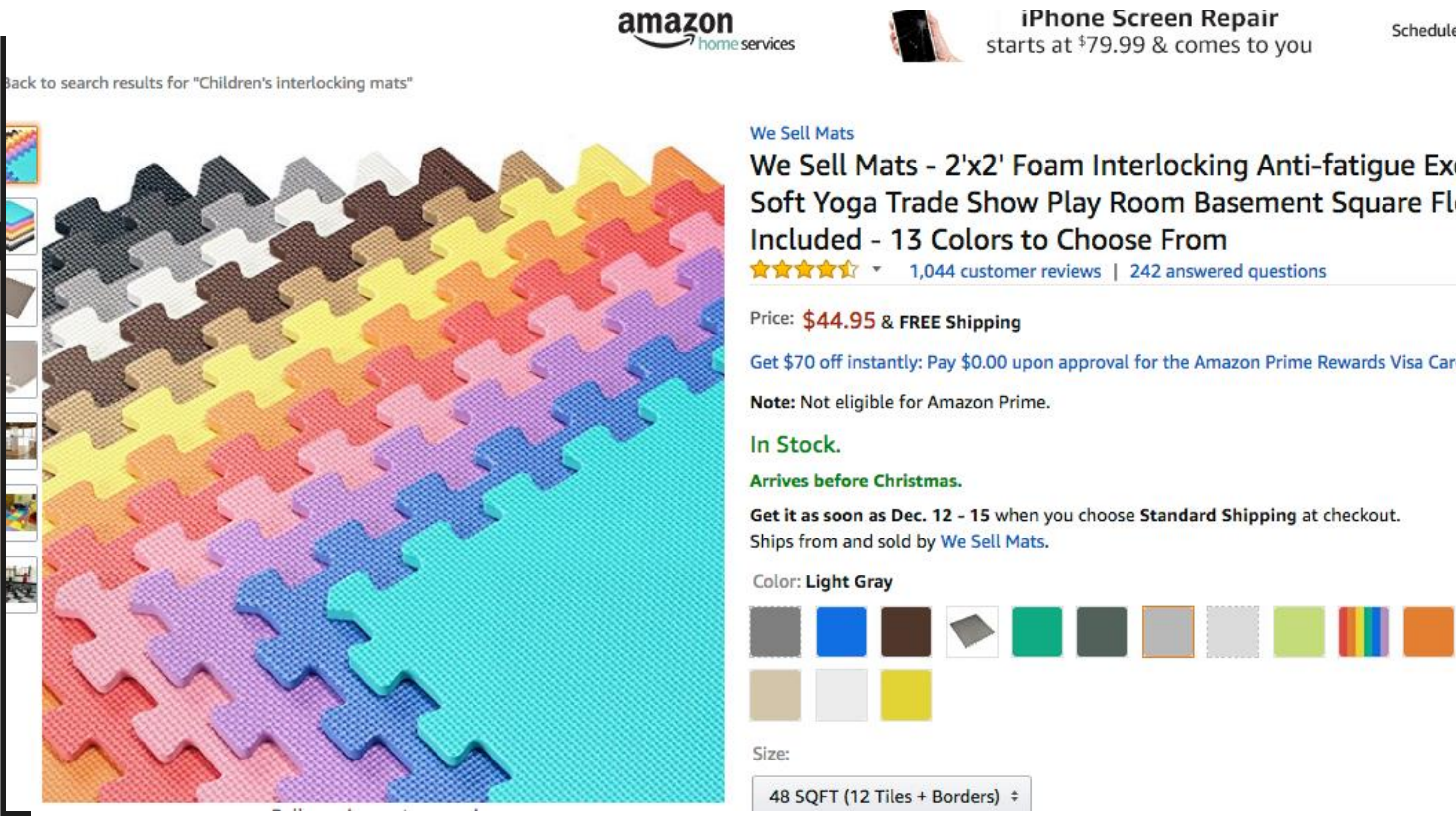


Raise the ground with mats

mats



SHOP NOW
SHOP NOW
The Flop 24″ Rubber Mat
$39.00
The Flip Flop 12″ Rubber...
$32.00
SHOP NOW
SHOP NOW

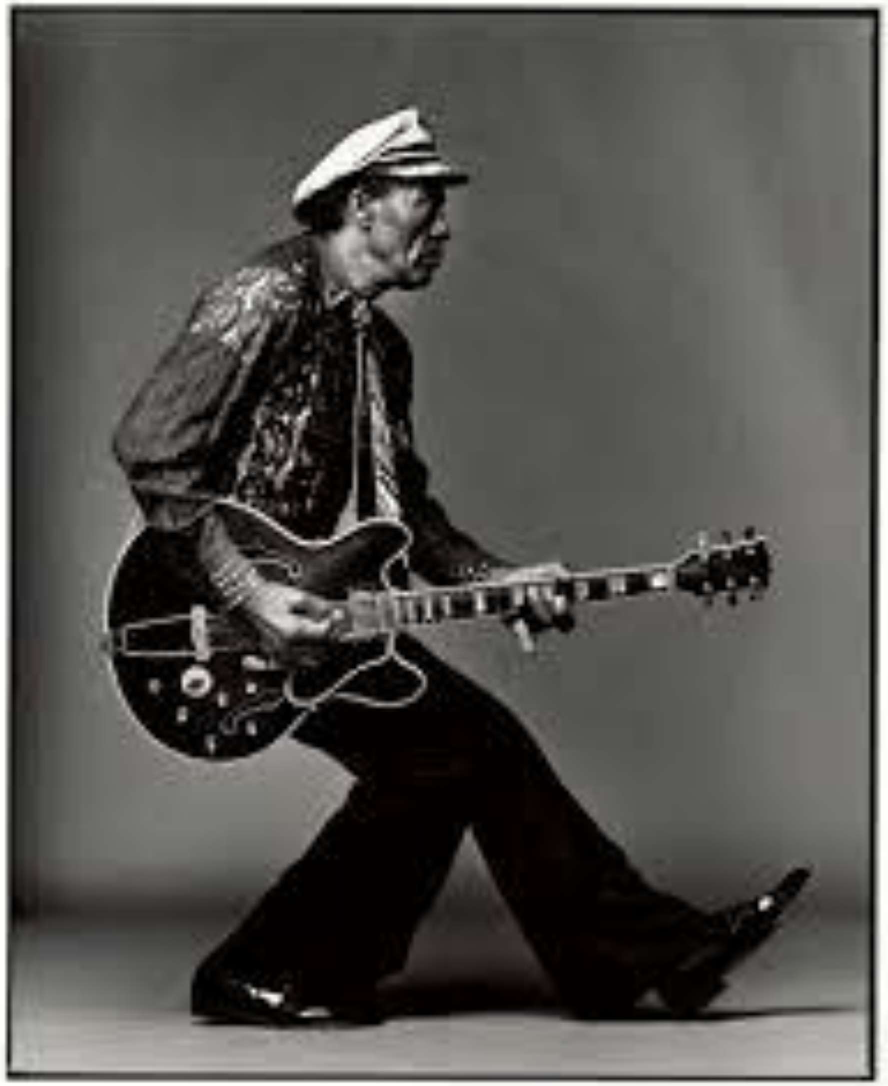


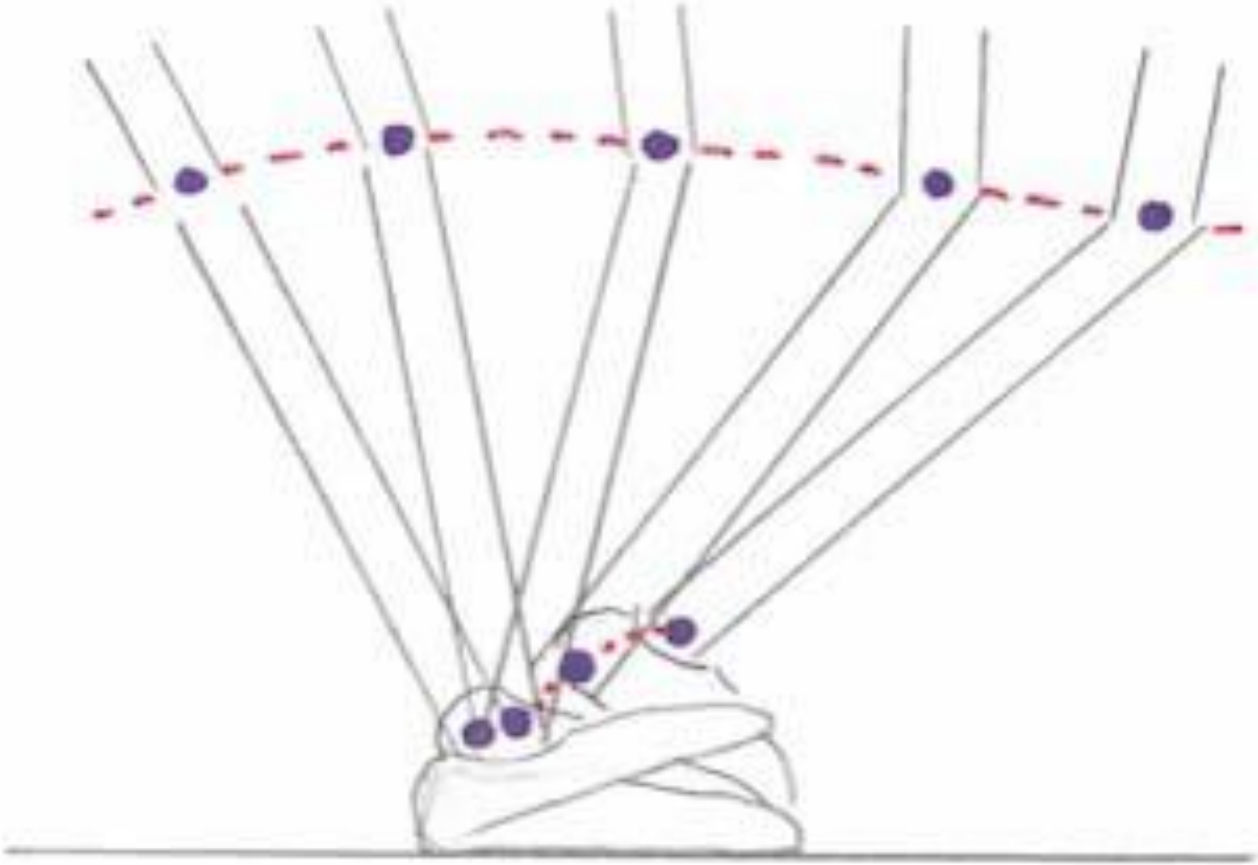
amazon home services
iPhone Screen Repair
starts at $79.99 & comes to you
Schedule
Back to search results for "Children's interlocking mats"
We Sell Mats
We Sell Mats - 2'x2' Foam Interlocking Anti-fatigue Ex
Soft Yoga Trade Show Play Room Basement Square Fl
Included - 13 Colors to Choose From
1,044 customer reviews | 242 answered questions
Price: $44.95 & FREE Shipping
Get $70 off instantly: Pay $0.00 upon approval for the Amazon Prime Rewards Visa Car
Note: Not eligible for Amazon Prime.
In Stock.
Arrives before Christmas.
Get it as soon as Dec. 12 - 15 when you choose Standard Shipping at checkout.
Ships from and sold by We Sell Mats.
Color: Light Gray
Size:
48 SQFT (12 Tiles + Borders)

Once energy is absorbed, it needs a direction

- Ankle rocker or its 8 ugly sisters give it direction

Ankle Rocker





Common cheat patterns

- Turn foot in
- Turn foot out
- Bounce over the top- bouncy gait

  Collapse arch

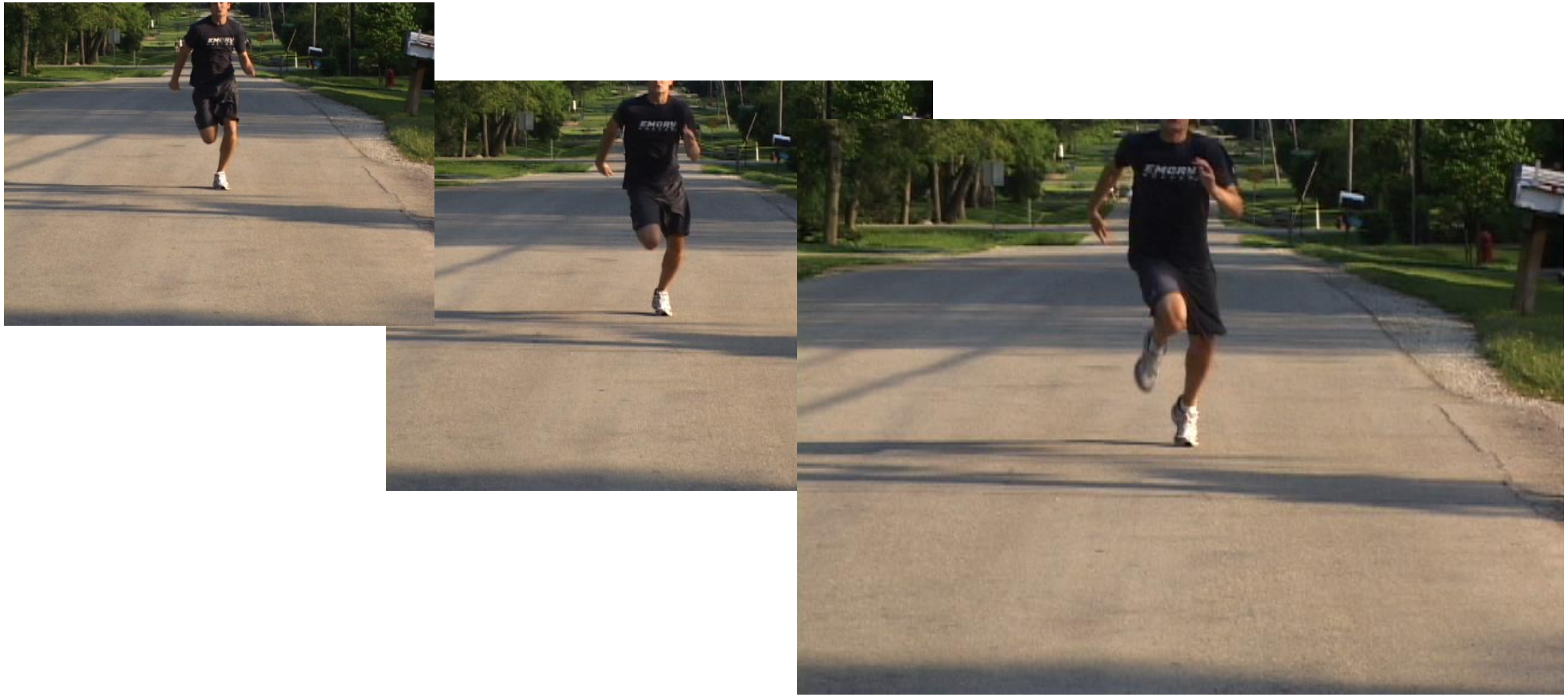
  Swing hips

  Outside of foot

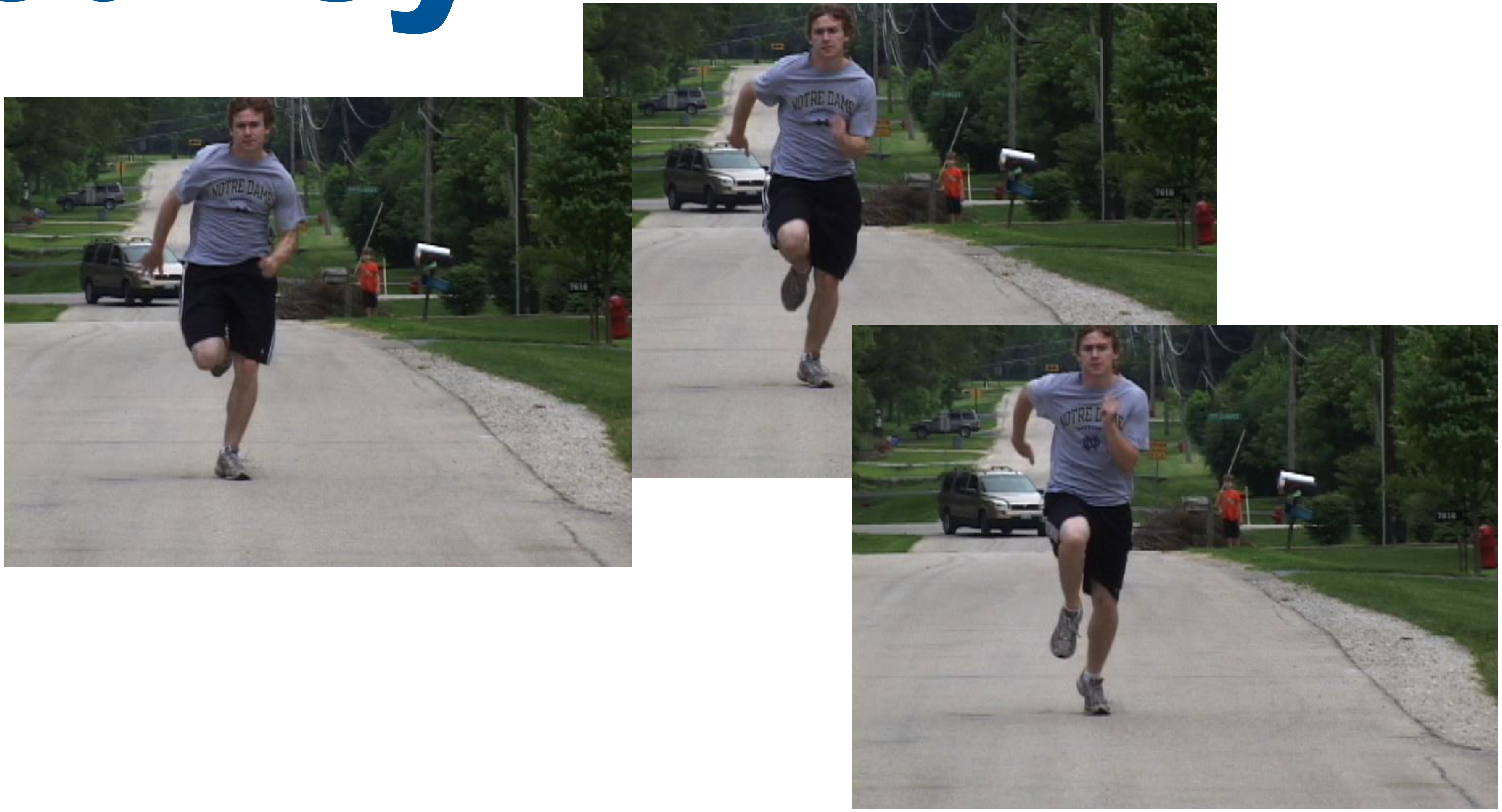
  Throw body weight forward

Turn foot in

out



Bouncy



Spin out through big toe

Anterior tilt

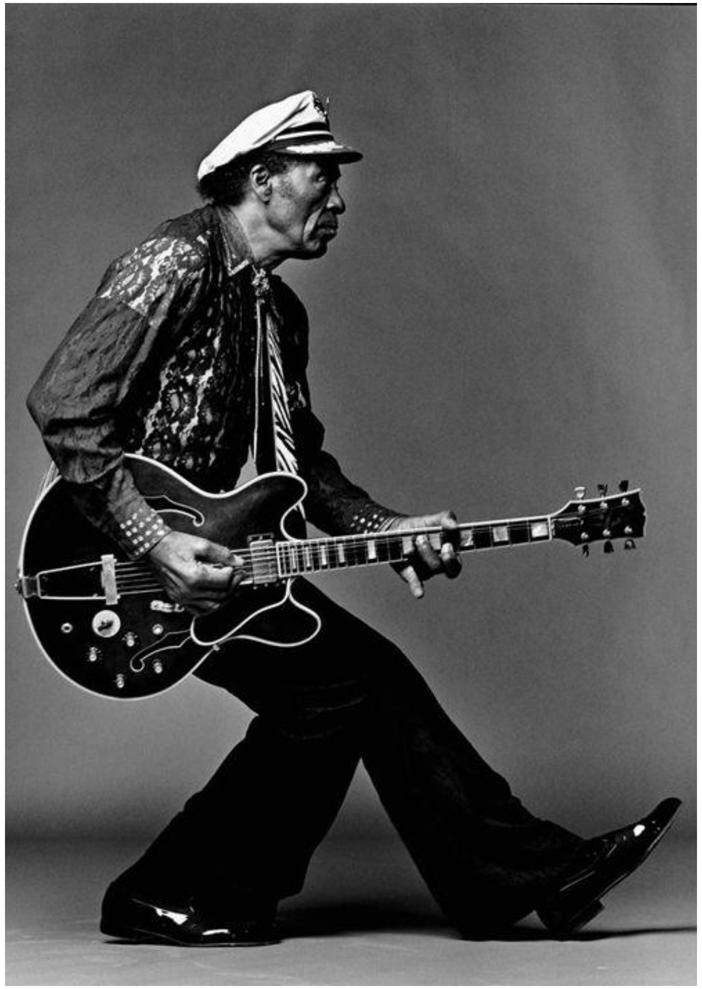
Hips or knees swing wide

Throw weight forward

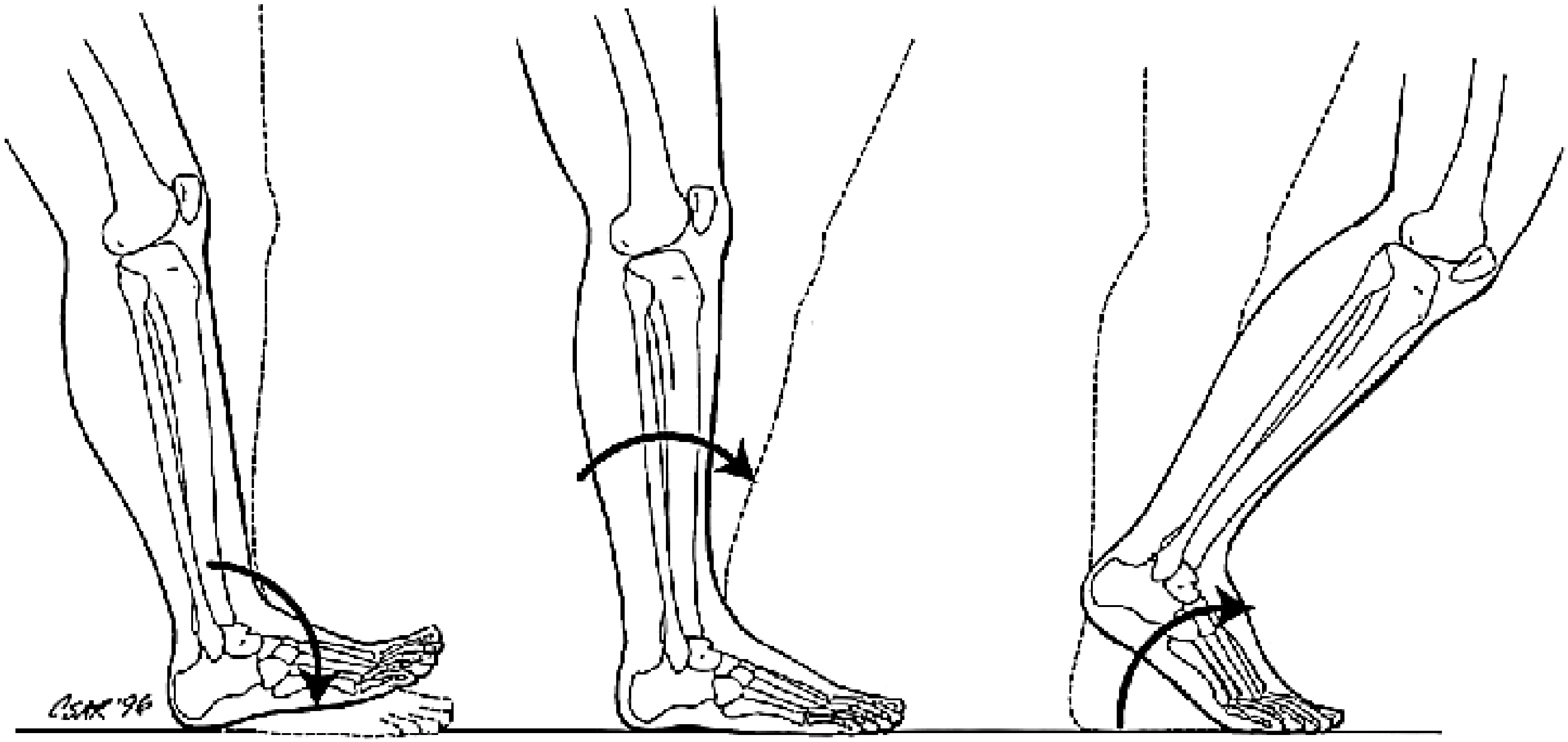
Exercises

- Wind shield wipers
- Single leg squats
- Shuffle walks
- Ankle jumps
- Overspeed/French Contrast
- Uphill Toe pops

- Add to all exercises in weight room
- (Squats, lunges)



Once ankle rocks, goes to forefoot rocker



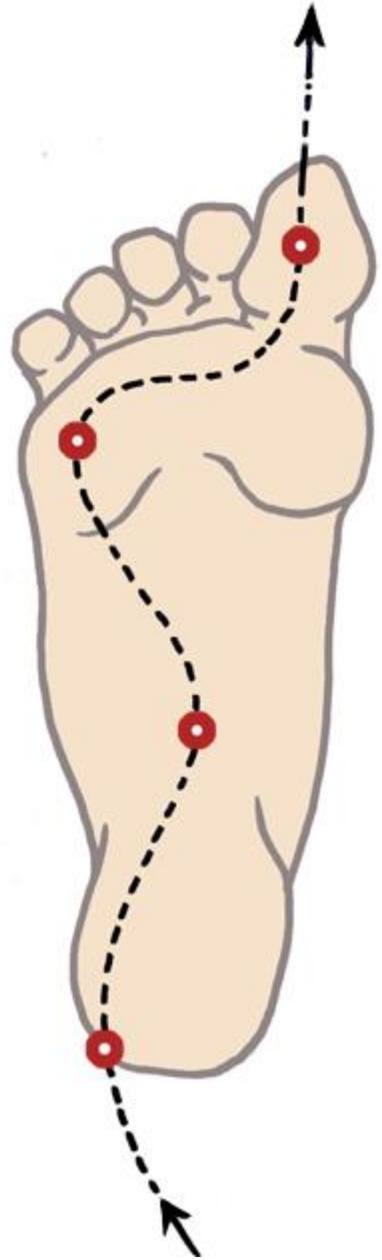
(a) Heel rocker
(first)

(b) Ankle rocker
(second)

(c) Forefoot rocker
(third)

Toe-off

Propulsory Foot
Receptive Foot



The potential of toe flexor muscles to enhance performance, Goldmann, J. Journal of Sports Science, 2013

- Toe flexors transmit energy produced by hip/leg extensors
- No impact on top end speed or vertical jumps but big impact on horizontal jumps and acceleration

If missing big toe...

Drill for toe off

- ISO toe holds
- Stair walks
- No arm runs
- Single leg cleans
- Single leg hops down a line with stick on back


UM SPORTS

Can you…..?

- Stand on 2 feet balanced on your foot tripod?
- Stand on one foot and stay balanced on your tripod?
- Ankle rocker squat and keep the tripod and shin splits the big toe gap?
- Do it eyes closed?
- Do it again and come up on your big toe
- Bend your toe back?
- Fold your big toe

To sum up

- The more functional the foot is, the more power the brain will allow it to have

- Can squat 1000lbs, but if foot doesn’t function properly, brain will protect it and limit the power so you can get away from the grizzly bear

The potential of toe flexor muscles to enhance performance, Goldman, JP, J. of Sports Science, 10/12

- TFM contribute greatly to horizontal lean-forward situations
- Respond quickly to strength training- up to 60-70% in weeks
- Significant improvements in all horizontal movements

An estimation of power output and work done by the human triceps surae muscle tendon complex in jumping, Bobbert, M, et al. J of Biomechanics, 1986

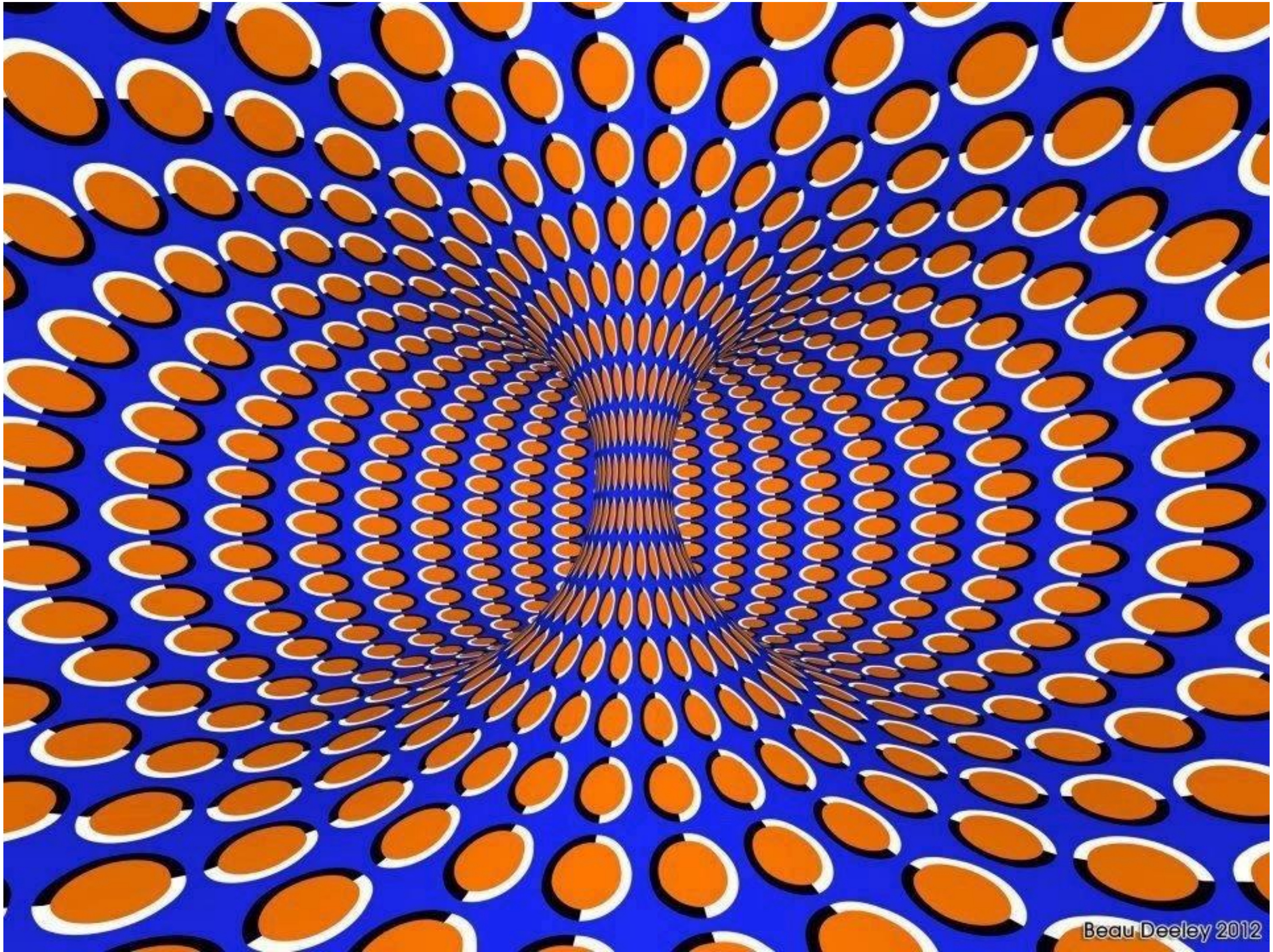
- Tricep Surea MTU responsible for 53% of power the last 50ms of take off

Where to find me

- @Korfist
- @TF Consortium
- www.trackfootballconsortium.com
- www.sellfy.com/korfist
- www.slowguyspeedschool.com

TFC 9

- June 21-22 Benedictine U
- Friday evening
- All day Saturday
- JAX Jaguars staff and the rest of rogue’s Gallery

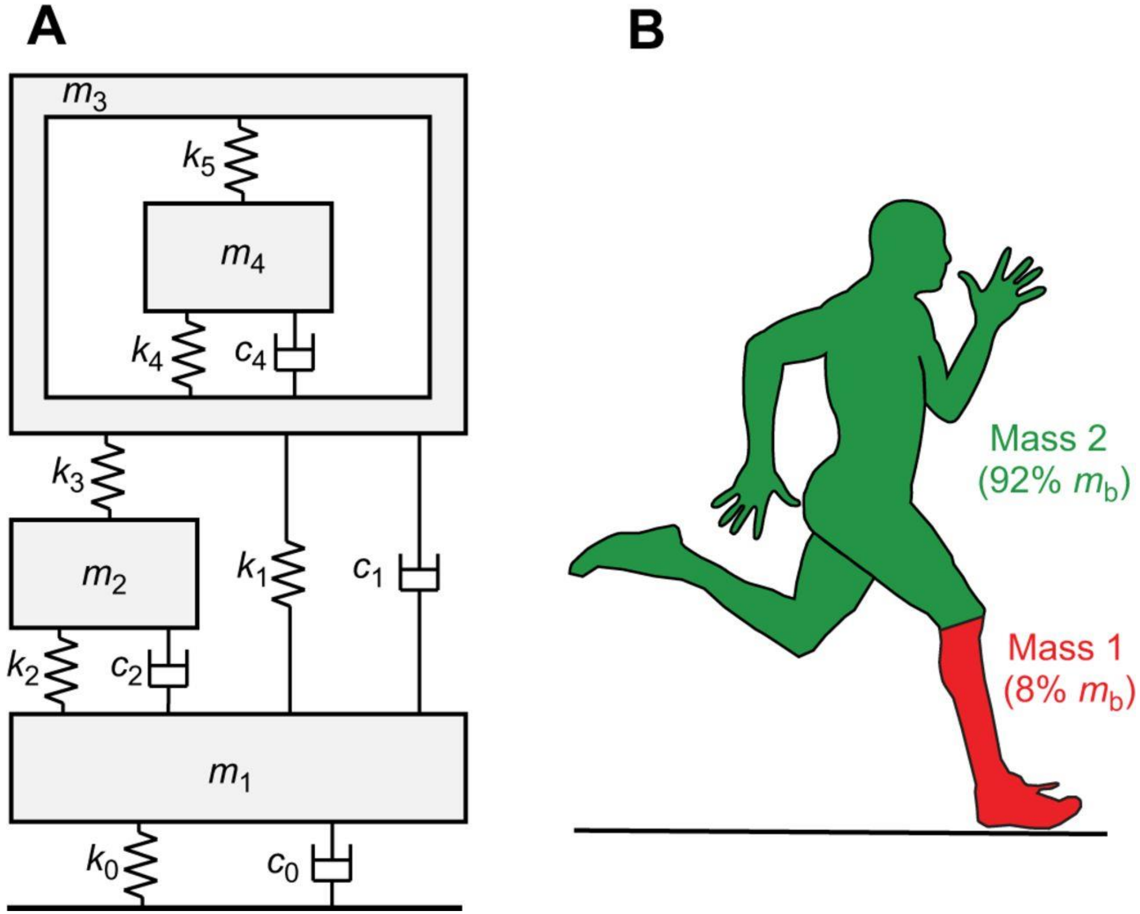

Beau Deeley 2012

+

A general relationship links gait mechanics and running ground reaction forces

- Ken Clark, Laurence Ryan and Peter Weyand

Ken Clark’s 2 mass model



Explains and predict the ground reaction force of runners

Sorry, Charlie Francis fans... at the right speed, no deceleration

- “No one fast trains this way.” This is not an argument and there have been some improvements in technology. And now, a lot of people are using…quite a bit

- Foot strike out in front with increased contact times
  - We didn’t find that t be the case with out 14 sprinters ranging from 11.0 -10.39

To sum up

- Motor skill- challenge environment to force body to react in more efficient manner
- Stumble reflex challenge the body to stiffen faster with the knowledge that it could fall
- Clark- lower limb responsible for a lot of the work going on in sprinting and going faster improves power output or GRF in applicable fashion

How can we apply it to our 3 day workout?

1080 tow video