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LTCD

Long Term Coaching Development

Is an Educational Series whose purpose is to provide and serve a unique Learning and Development Framework for Coaches at all levels. It's also an entry point for coaches on an educational path and those looking to meet the demand of coaching, training

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SPEED
EXPLOSIVE
STRENGTH
ENDURANCE
COORDINATION

DYNAMIC
ANAEROBIC
MAX VELOCITY
NEUROMUSCULAR
ACCELERATION
FORCE
APPLICATION
MECHANICS
ATHLETIC
SYNERGISTIC
STABILITY

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SPEED



What is it Really?

Learning Speed Intelligently

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What is it really?

coup de grâce (koo de gräs)

“Deathblow – Finishing Stroke – End all be all”

Speed is the Determining Value: It is the factor that will decisively determine the outcome of a race. Neither it or those things that are part and parcel of speed can be ignored.

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SPEED

- **Instantaneous Speed**

(The Speed of an object at any given time)

- **Average Speed**

(Distance over Time: speedometer reads 60 miles per hour is at average speed)

- **Constant Speed**

(Speed that doesn't change: Earth rotating around the sun at 67K mph)

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NEED FOR SPEED

1. Develop the speed you need at the highest level (velocity) before any Speed Endurance work can be done. (Long-Short / Short-Long)
2. Speed Endurance relates to the effectiveness of the Speed we have available to us.
3. Speed Endurance **FIRST** fails to give us the (velocity or speed) we need to have available to run our chosen event.
4. So Why do Coaches do it?:
 - a) Because of the time they have available to them.
 - b) Tends to get you fit really fast
 - c) There's less chance of injury

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NEED FOR SPEED

Base on a 2% increase in speed

1. Girl who runs 12.0 for 100 Meters $\{r=d/t\}$ 8.3 m/s
2. 2% increase and he runs 11.76 $\{r=d/t\}$ 8.5 m/s
 - 7.9 inches more a second
 - Difference of Winning CCS / Placing 15th at State
 - Winning CCS / #10 All Time top 100 / Placing 4th at State
1. Any Distance over 100 meters ran at that 2% should be a lot faster and feel a lot easier.

Point: is there is a Need for you to have more Speed available to you.

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NEED FOR SPEED

	Ben '88	Carl '88	Mo '99	Mo '01	Tim '02	Asafa '05	BOLT '08
RT	0.132	0.136	0.162	0.132	0.104	0.150	0.165
0-10m	1.83	1.89	1.86	1.83	1.89	1.89	1.85
10-20m	1.04	1.07	1.03	1.00	1.03	1.02	1.02
20-30m	0.93	0.94	0.92	0.92	0.91	0.92	0.91
30-40m	0.86	0.89	0.88	0.89	0.87	0.86	0.87
40-50m	0.84	0.86	0.88	0.86	0.84	0.85	0.85
50-60m	0.83	0.83	0.83	0.83	0.83	0.85	0.82
60-70m	0.84	0.85	0.83	0.83	0.84	0.84	0.82
70-80m	0.85	0.85	0.86	0.86	0.84	0.84	0.82
80-90m	0.87	0.86	0.85	0.89	0.85	0.85	0.83
90-100m	0.90	0.88	0.85	0.91	0.88	0.85	0.90
TIME	9.79	9.92	9.79	9.82	9.78	9.77	9.69
Courtesy of SpeedEndurance.com							

BOLT '09	
RT	0.146
0-10m	1.89
10-20m	0.99
20-30m	0.90
30-40m	0.86
40-50m	0.83
50-60m	0.82
60-70m	0.81
70-80m	0.82
80-90m	0.83
90-100m	0.83
TIME	9.58

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WHAT IS VELOCITY or RATE of SPEED?

Simply put Velocity is the Distant traveled in a certain Time in a certain Direction: example: 55mph north (Distant=55mile + Time=hour + Direction=north)

WHAT IS ACCELERATION?

Acceleration is change in VELOCITY. In practical sense Acceleration is change in an Athletes Rate Of Speed (ROS)

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Better is the end of a thing than its Beginning

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WHAT IS THE PURPOSE OF THE BLOCKS?

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To put you in a position to ACCELERATE
efficiently and effectively up the track!

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Every great Athlete knows exactly where they are in space.

~Vince Anderson
(Coach and Educator)

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PROPRIOCEPTION

The ability to sense the position, location, orientation and movement of the body and its parts

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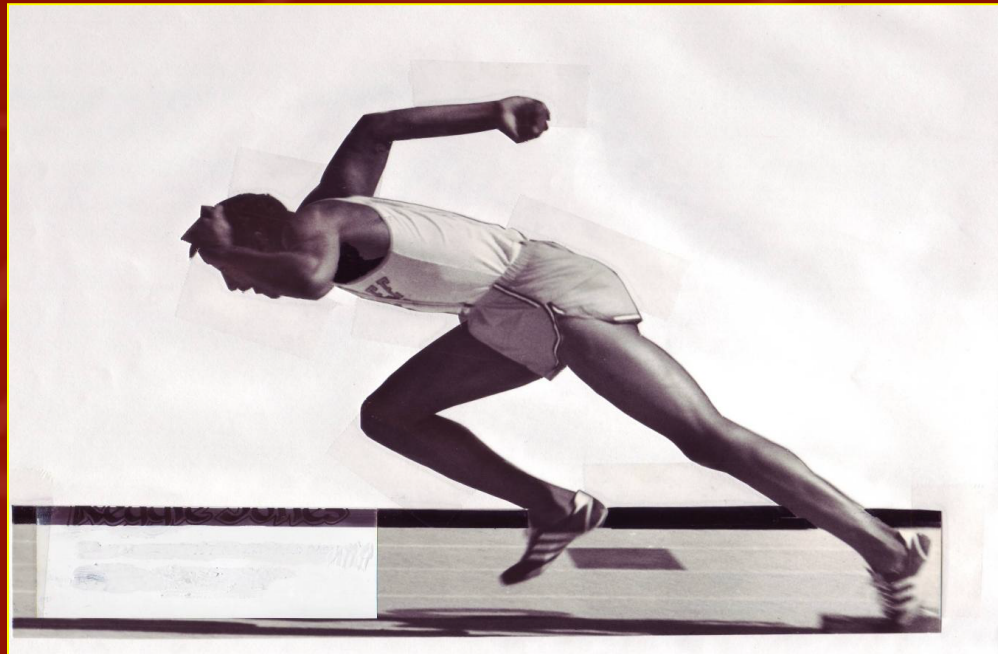
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In the 70's We were taught to keep the shoulder low.

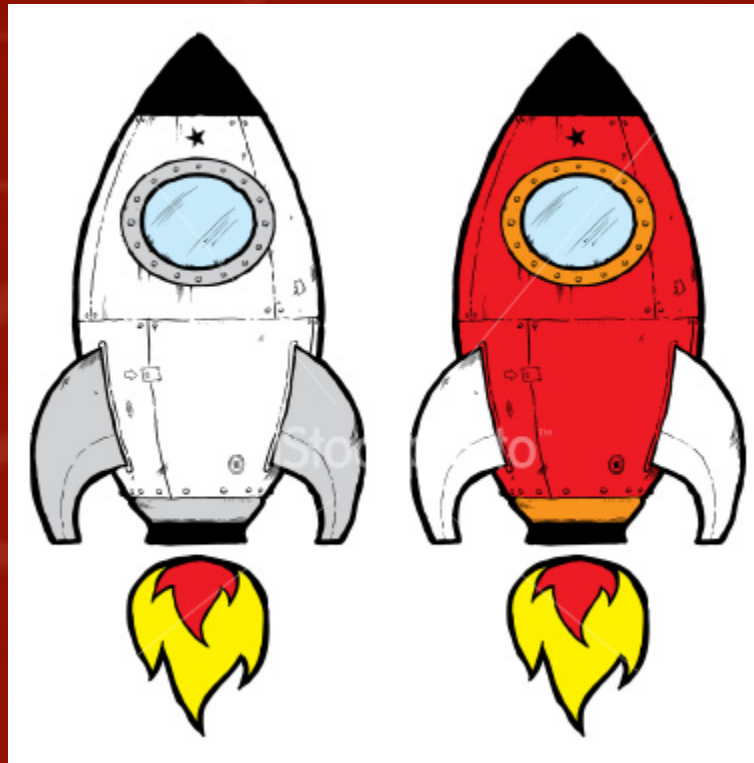
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FORCE 'ing the issue

Force results from interaction. As it applies to acceleration, its a pushing motion that results from our interaction with the blocks. Its Newton's 3rd Law: *For ever action there's an equal and opposite reaction.* This statements means that the size and direction of force applied into the blocks is equal to the magnitude (size) and direction of force that is redirected back into the body.

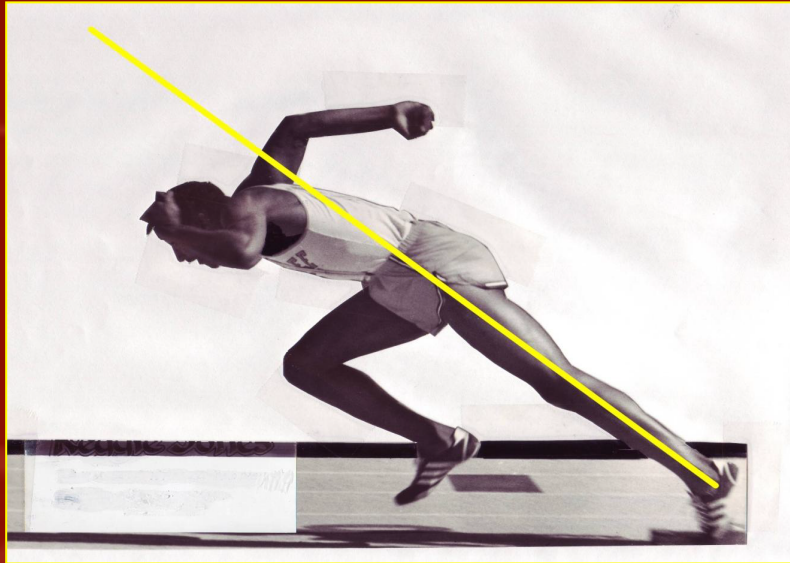
Force always comes in pairs!

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In the acceleration phase the generation of force (mass-specific force) is the important factor and its influences are both strength and power.

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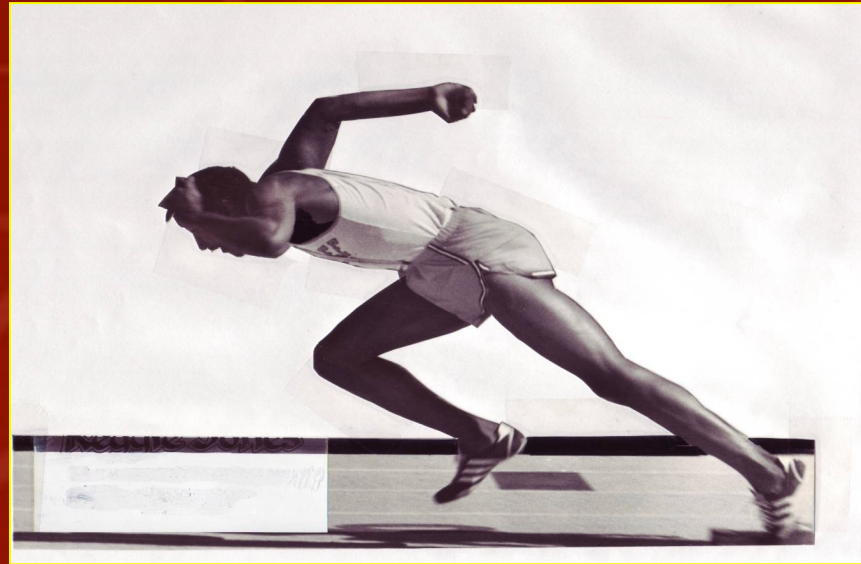


On the subject of magnitude and direction, applied force travels in a straight line. (*through the legs, hips and into dead space*)



This teaches us that Force cannot turn a curve.

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In the acceleration phase the generation of force is the important factor . So muscle recruitment plays a large role. For example the Erector Spinae (The Back) is capable of rotating the pelvis and can transfer energy through the pelvis, using the pelvis to aid the legs to apply force to the ground. But when the body is hanging forward this weakens the role of the back muscles responsible for keeping the body and spine straight and diminishes the response in efforts to generate force.

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TRIPLE EXTENSION

Is characterized by simultaneously extending the ankle, knee and hip joint.

The advantage of triple extension is there's a higher muscle recruitment "Calves, Hamstring, Glute, Lower Back, Quads, Core" All of which are important in the acceleration phase.

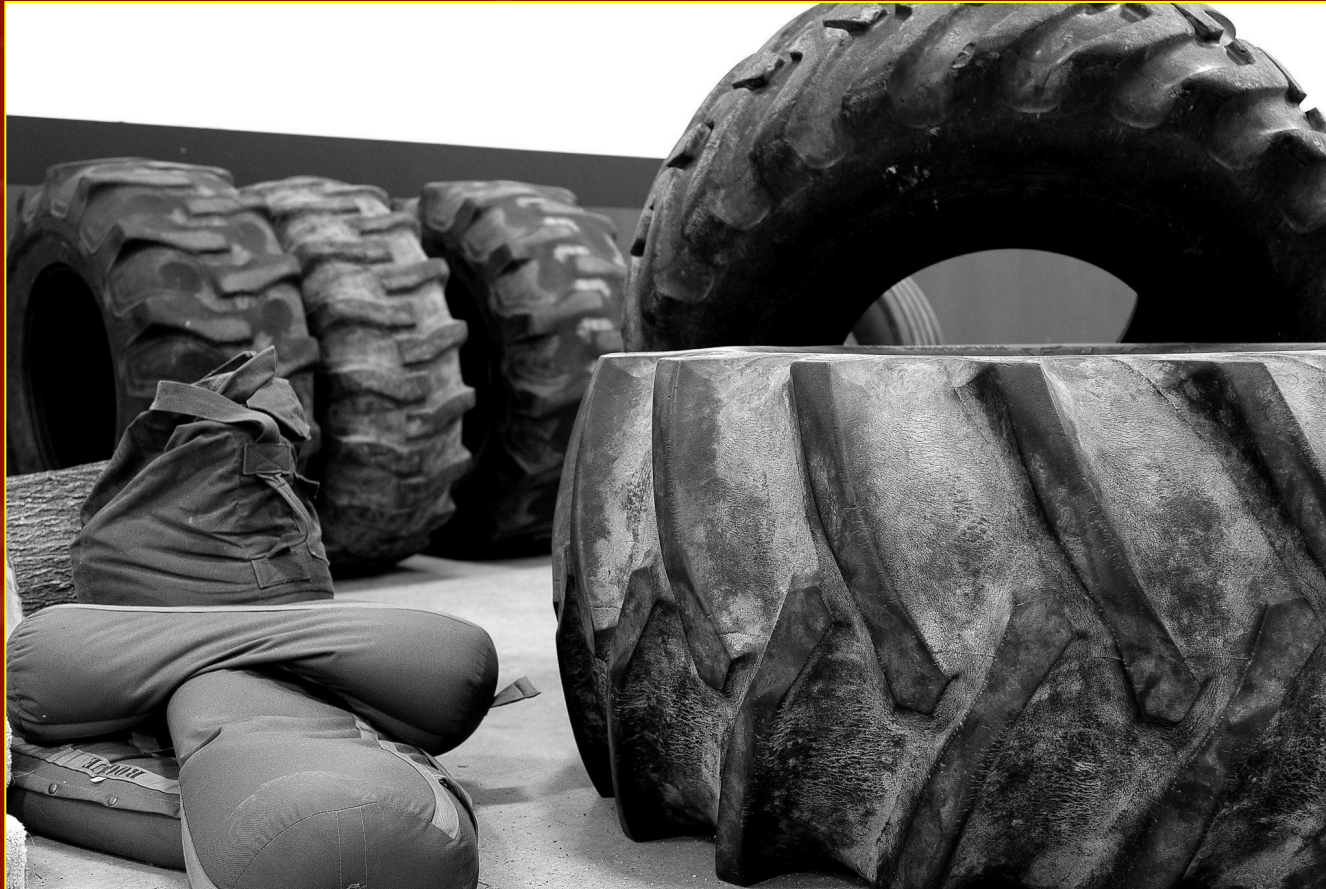
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The athlete who can find him or herself in a favorable position , has strong muscles and good inter-muscular coordination will be able to hold this position longer, therefore prolonging the acceleration phase.

(45 degrees is the ideal angle when accelerating but as the athlete becomes stronger, a more acute angle can be utilized)

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UNDERSTANDING THE OBJECTIVE

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STARTING BLOCKS

“The Start Sets Up The Finish”

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BLOCK SETTINGS

“No One Size Fit All”

1. Measuring the Feet

FB: 2 foot lengths from the starting line

BB: 3 foot lengths from the starting line

2. Mathematical formula

TL: Measure Top of Trochanter to the bottom of the heel

FB: $.56 \times \text{Trochanter Length}$

BB: $.42 \times \text{Trochanter Length} + \text{FB}$.

3. Traditional Ways: Tom Tellez & Vince Anderson

The traditional way relies more on body awareness and leg positioning. In this method we first start by putting the knee of the front leg to the starting line. Then place the front foot pad directly under the foot for the placement of the front foot pedal. We then measure from the starting line to the front of the pad. From the starting line we measure 4 inches less than that of the front pad where we place the knee of the back leg. Then place the foot pad directly under the foot for the placement of the back foot pedal.

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BLOCK ANGLES

“No One Size Fit All”

- When setting up the foot pedals, make sure the Front Block Pedal is set all the way down (typically 30°) to create the smallest possible angle with the track.
- A 30° to 45° angle best utilizes the “Stretch Shortening Cycle”, which means you get the most POWER out of the stretch reflex or a better contribution to force production. Energy stores are better and results in a better elastic response. Also decreases the amount of time an athlete has to spend pushing off the pedals.

Sticking Point: Stretch Reflex is a muscle contraction in response to stretching within the muscle. In other words when a muscle lengthens (stretches) the muscle spindle is stretched increasing nerve activity. This nerve activity causes the muscle to contract and thus resist the stretching. (trying to bring things back to their set point)

The Error: When the foot pedal (typically the back foot pedal) is set higher than 45° - 55° (less of an angle) or perpendicular to the track. This causes plantar flexion in the set position, therefore relaxing the muscle fiber. Causing the athlete to have to push longer to create force production.

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- Shoulders over arms
- Shin parallel with track
- Head in a neutral position
- Hips over the foot
- Back thigh perpendicular with the track

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- Shoulders over arms
- Head in a neutral position
- Hips over the foot and Back thigh perpendicular with the track
- Shin Parallel with one another

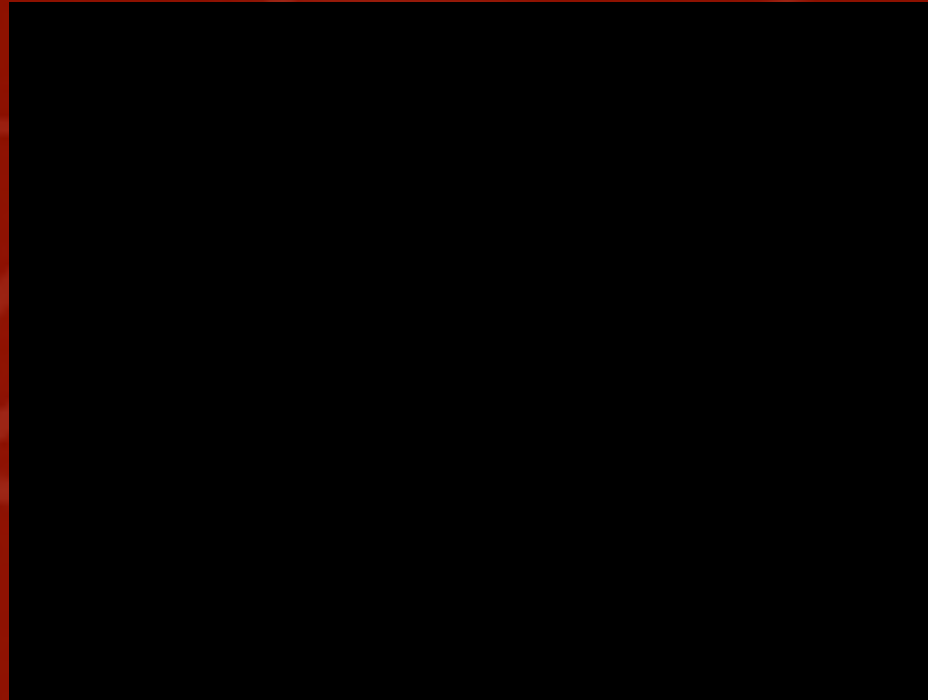
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Inherently Stable Position

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Pressure Position Power



If positioned correctly (*in the set position*), the shin of the front leg should align with the shoulder. Executed properly the shoulder should follow that line through the push phase to extension.

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PUTTING IT ALL TOGETHER



- Feet firmly squeezing against the foot pads
- Push into the blocks not out
- Baton pass with arms to complete limbs
- Hips constantly moving forward advance pass the starting line

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BLOCK EXIT

The Block exit is the moment the gun goes off and ones neurosenses are stimulated causing an reaction of force application that induces forward motion.

Its a simple way of getting from what we call the “Bottom to the Top”. The objective is to exit the blocks with not only power and speed but posture that will allow us the accelerate up the track most efficiently and effectively.

Sticking Point: Foot Pedal - We teach that both feet should be pressed firmly against the blocks. Some coaches like to teach their athletes to leave space between the heels and the foot pads because they think that it will help in the force application process.

Another way of looking at that process is in the weight room. Imagine doing a clean. You wouldn't have your female athlete whose about to clean 160lbs, position her self on her tippy toes. No! because what sense would that make and why add the extra motion.

Using the complete foot to apply pressure to the foot pedals creates a greater ratio of force in the direction of motion we intend to go, which in this case would be forward motion.

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LOW HEEL RECOVERY

Low heel recovery is emphasized when the back foot passes the front foot in action. This is what we call ankle-to-ankle. This simply means that when the back foot passes the front it should be ankle to ankle with the front foot, Causing the heel to keep low to the ground.



- **Common problems** we see with athletes during Block Exit is with what we call winding or looping. This is when the back heel instead of moving forward moves up towards the butt and further away from the ground. The further we move our foot from the ground the more we increase the time to the point of contact.

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COMMON PROBLEMS: Feet, Legs & Hips

- Another common mistake that athletes tend to make or do by failing to push completely through the front pedal, is dropping that back foot to the ground too fast. When this happens the front leg isn't allowed to go through a functional range of motion and can cause the Center of Gravity to be too low and deteriorate the athlete's ability to create great forces and cycle their legs underneath them.
- Instead an athlete should push through (into) the pedal for as long as they can. The longer you push the better the drive and the more likely you are to get a great extension and store up energy for a better elastic response.

Sticking Point: Another very good point to make here is in the use of the Hips. Tony Veney used an interesting analogy. He said “***we don't drive with our tires, we drive on them. We drive with the engine***”. Well what he meant was we don't run with our feet, we run on them. We run with our hips. Our Hips are the “**Engine that turns the Crank Shaft that turns the Wheels**”.

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COMMON PROBLEMS: Arms

- A crucial area for success in acceleration but often ignored is the behavior of the arms and development of upper body strength. Arm action can contribute to the force an athlete applies to the track. Arm movement help stabilizes the body in motion, but also takes advantage of the global workings of the central nervous system.

As you move your arms explosively, the neurological signals sent to the arms also spill-over to the legs. The more forceful and explosive the arm drive, the more forceful and explosive leg drive will be.

All leg movement happens in an coordinated effort with the arms. Its this coordinated movement that is the key to efficient sprinting and its through range and force that the two coordinate. A queue to remember is the Arms lead the legs into range of motion, force and speed. As well as contribute to stability and propulsion, Coordination between the arms and legs can give a runner a mechanical advantage over their competitors.

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CORRECTING ERRORS

- There's a lot that goes on with the start and a lot can go wrong. So an important thing to remember is when you're trying to correct something with the start, be careful trying to correct on top of the error. A lot of times when an error occurs it stems back to something that's happened before the error.
- Drills are an important tool to fixing errors and teaching corrective exercises patterns because it teaches the skill and action of those things we are trying to execute. It's been determined that it requires approximately 300-500 repetitions to develop a new motor pattern. But where bad or inadequate habits are already in place, it requires about 3000-5000 repetitions to erase and correct a bad motor pattern. So we do drill after drill after drill after drill until eventually you see the drill inside the skill.

Instructions vs. Correction: A lot of coaches have a problem understanding the difference between instruction and correction and often give their athletes instructions that they think are corrections. Instructions are directions or orders given. Correction is action or the process of correcting something. A change that rectifies an error.

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1. Body Position
2. Set Position
3. Foot Placement
4. Hands Initiate Movement
5. Upper body / Shin
6. Foot = Knee to Knee
7. Eyes looking where to step
8. Repeated Block Exits
9. Arms Lead the legs
10. Good Stretch Reflex
11. Hip Height and Strength
12. Leg Cycle

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1. Exit Body Position
2. Heel Recovery
3. Eyes looking where to step
4. Upper body / Shin
5. Foot = Knee to Knee
6. Repeated Block Exits
7. Arms Lead the leg
8. Hip Height and Strength

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ACCELERATION

- Simply put acceleration is change in VELOCITY. Its the rate at which the speed of an object is changing and takes place the first 0-30 meters or about 3-4 seconds from the start of the sprint.
- Acceleration development should be a main focal point in training. The most important factor in sprinting is an athletes ability to accelerate and generate speed in a short period of time.
- **Sticking Point:** When it comes to training young people, especially during the installation of body movements, functional for sprinting. Its important to understand the Sensitive Periods of Physical Development” as it relates to sensitive age ranges. Because its during these periods of physical development that performance capacities are largely increased and leads to maximal improvements during this period. For boys that period is between the ages of 12-17 and for girls between the ages of 10-13.

Because Movement is a developed and learned behavior its important that we show a sense of urgency to focus, teach and install the important things upfront. Our awareness of these periods will help us see the importance of early developmental training, so we can better guide the developmental procedures.

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6 specific activities of Acceleration

1. **Stride Length = Short to Long:** Starts off short and increases until maximum velocity is reached (when the stride length is optimal)
2. **Ground Contact Time = Long to Short:** Ground Contact Time is the amount of time each foot spends on the ground. It is longest at the beginning of a sprint as the weight of your body is fighting gravity to create velocity through force application.
3. **Shin Angle with ground = Small to Large:** The shin angle is going to determine the force application to the ground and the projection angle that the athlete is going to drive out at. The shin angle opens up and increases throughout acceleration and into maximum velocity.
4. **Velocity = Slow to Fast:** Velocity is both the speed and direction that the body is moving. As the athlete accelerates, the rate and distance will increase with time.
5. **Stride Frequency = Slow to Fast:** Like ground contact time, it starts off slower and increases until stride frequency reaches optimal level at maximum velocity.
6. **Heel Recovery = Low to High:** Heels should recover quickly, with limited backside mechanics and shouldn't involve large amplitudes of motion behind the hips. During acceleration, especially the first 6-8 steps, you want to minimize your backside mechanics in a 2 stroke motion.

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ACCELERATION IN A NUT SHELL

- 1. Minimize Time In the Air**
- 2. Maximize Ground Contact**
- 3. Enhance Force Application**
- 4. Horizontal Forces Are Dominant**

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The Wood Cutter

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DRILL INSIDE THE SKILL

“They help to reinforce Pre-Determined Movement Patterns in the skill of Sprinting”

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ACCELERATION DRILLS

“Putting a brand-new operator at the wheel”

Vertical Box Jumps



Standing Long Jump

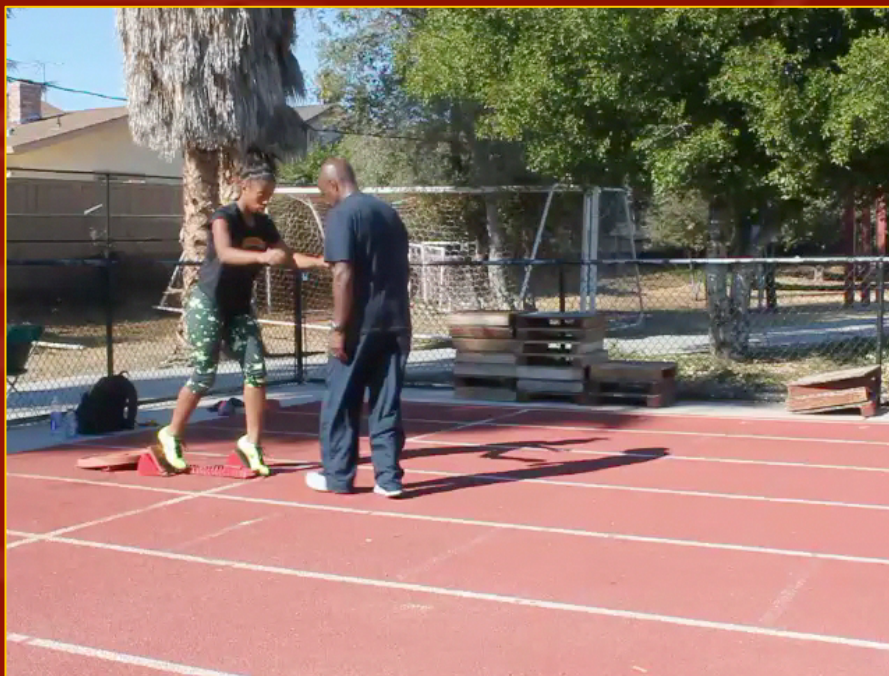


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Wall Sprints



Half Starts



Body Awareness drills

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Accelerated Stride Length Drill



Accelerated Tape Drill



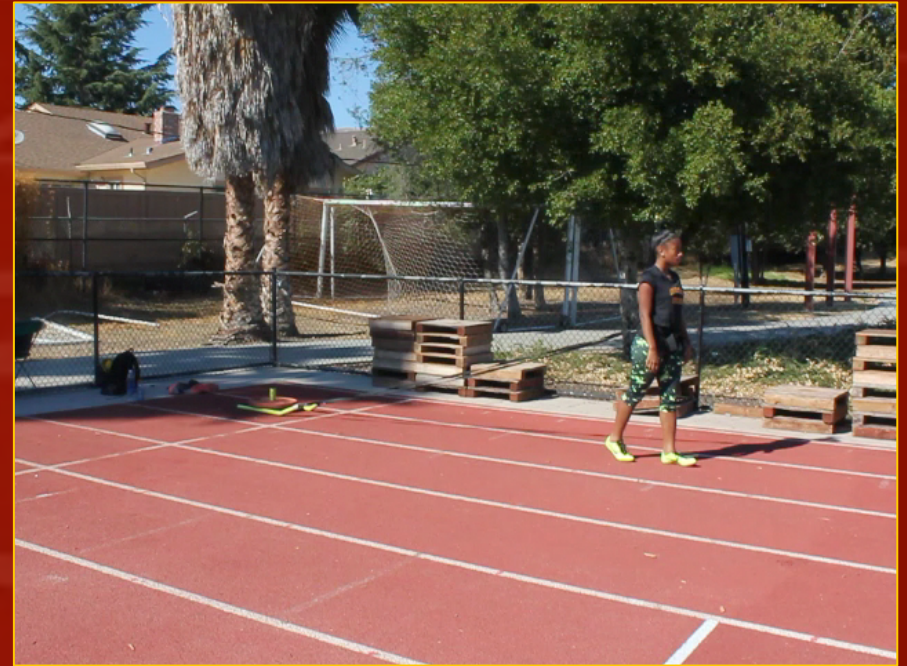
Performance Drills

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Sledded Skater Drill



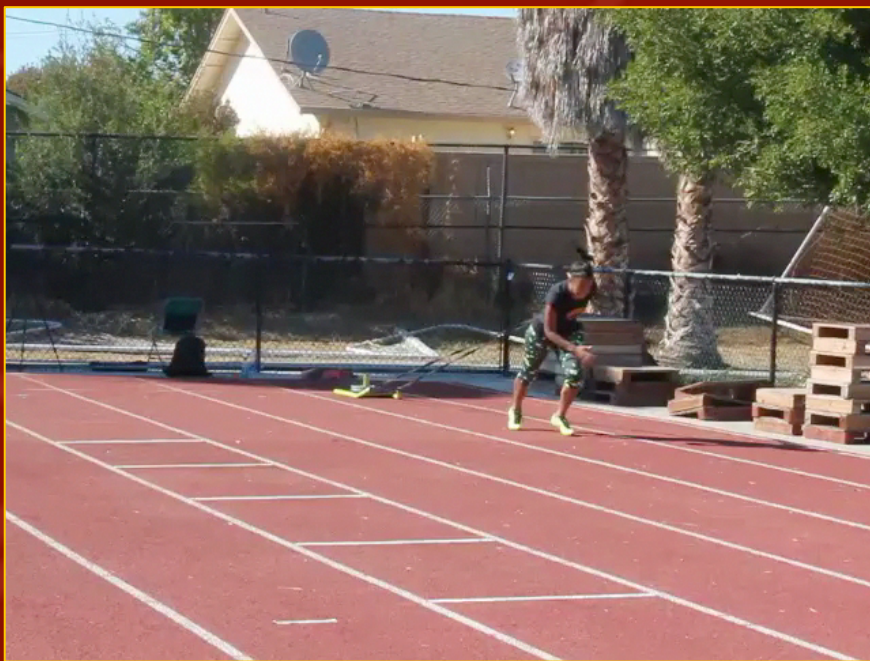
Sledded A-B Skips



Horizontal and Vertical Force Application Drills

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Sled Pulls



Hurdle Hops



Horizontal and Vertical Force Application Drills

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KNOW YOUR WHY!

- One of the goals to doing drills such as Acceleration patterning and Maximum Speed patterning is to program the athlete to the extent that they can reproduce the pattern without accessories
- To manipulate stride length and frequency to find the ideal ratio between the two
- To develop rhythm and posture and a more efficient movement behavior
- To put the acceleration and maximum speed patterns together for the athlete. To go from blocks through the acceleration phase and into the maximum speed phase.
- Last but not least: Speed is a Determinant Value!

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MAXIMUM VELOCITY

- **WHAT IS MAX VELOCITY:** Maximum velocity is the highest possible speed an object can travel before the forces acting on it reach an equilibrium and it is no longer able to accelerate and takes place at about 30-60 meters into your race.

For example a sprinter will accelerate rapidly until the forces acting against her become balanced and her speed is steady.

- In Acceleration the **HORIZONTAL** component is the important factor. (45 degrees, Shin angles, pressing and pushing down and back into the track), but the **VERTICAL** component is dominant in maximum velocity (Posture, Leg Recovery, Shin angles, Hip Mobility and Alignment, Ground Strike)
- Maximum Velocity or simple sprinting can be one of the hardest things to teach an athlete. But the difficulty lies with the conceptual deficiencies. Where most developmental coaches believe that the magic is in the work itself (running). So very little time is spent actually trying to teach sprinting (mechanics).

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5 specific activities of maximum Velocity

1. **Body Position** - This is the most central focus for changes in the technical model and thus for improving performance. If the athlete cannot execute the correct body position with a high degree of proficiency, it is nearly impossible to optimize the other activities.
2. **Recovery Mechanics** - This is the first phase of the high-speed running cycle movement. Often thought of as a passive movement and traditionally called the "swing phase", the mechanically efficient recovery of the limb sets up the other phases of the running stride for higher levels of mechanical efficiency.
3. **Transition Phase** - This is the phase of the running cycle where an abrupt change of direction of a limb must take place. Faults are often easily recognized in this phase, but they are almost always a product of a cause that is 180° on the other side of the stride cycle.
4. **Ground Preparation Phase** - This is the phase where the athlete must actively prepare the foot and the leg to strike the ground. From the point of view of determining the performance outcome, this is the second most important phase in the running cycle.
5. **Ground Phase** - This is the most important phase in the running cycle. Once the athlete leaves the ground, the flight path of the center of mass is unalterable until the next ground force application. Therefore, getting the Ground Phase right is essential.

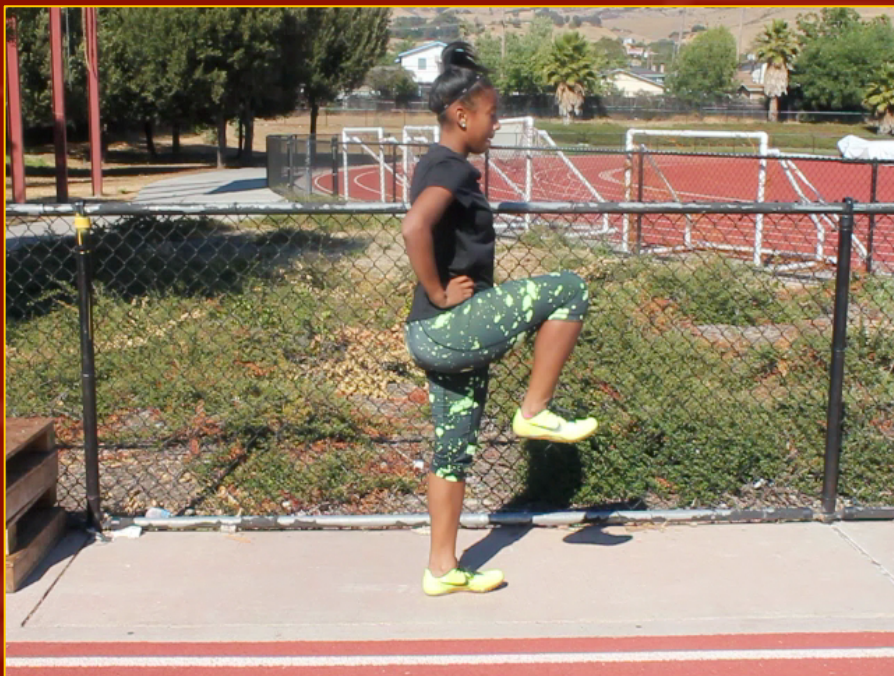
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MAXIMUM VELOCITY MECHANICS

- **Posture:** One of the greatest emphasis in Maximum Velocity. Posture is where the body is erect and not leaning forward. Athletes and even coaches tend to have these conceptual deficiencies and this perception, conscious or otherwise that you must lean forward or bend at the hip to run fast.
- **Rhythm:** Rhythm is another great emphasis. Science has taught us that sprinting/speed is a combination of Stride Length and Frequency.
 - * Proper Ratio between the two
 - * Accelerated Stride Length Drill is one of many measured tools we use.
 - * Wickets at a prescribed length (using a proportional chart) to teach rhythm and mechanics at a much lower intensity, that is much easier for coaching athletes away from dysfunctional tendencies (poor posture, insufficient hip flexion and knee extension, stride length, frequency) . Coaching them into a 3 stroke motion.
- **Technical Mastery:** Body Awareness, both stationary and moving. (Pose, Walk, March ...etc) **[High Knees]**
 - * Body awareness drills to teach them to feel the position The goal is to get them to pose in these positions with aid and eventually without it. Instructing and correcting them to stay TALL! Head Up!, Chest Up!, Hip Up! , Knee Up and Toe Up! all at the same time.
 - * Moving Drills: Pre-determined movement patterns in the context of performance

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Front side Recovery Drill



Fast Leg Drills



Speed Drills

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Max Velocity Drills



Ultra Speed Tows



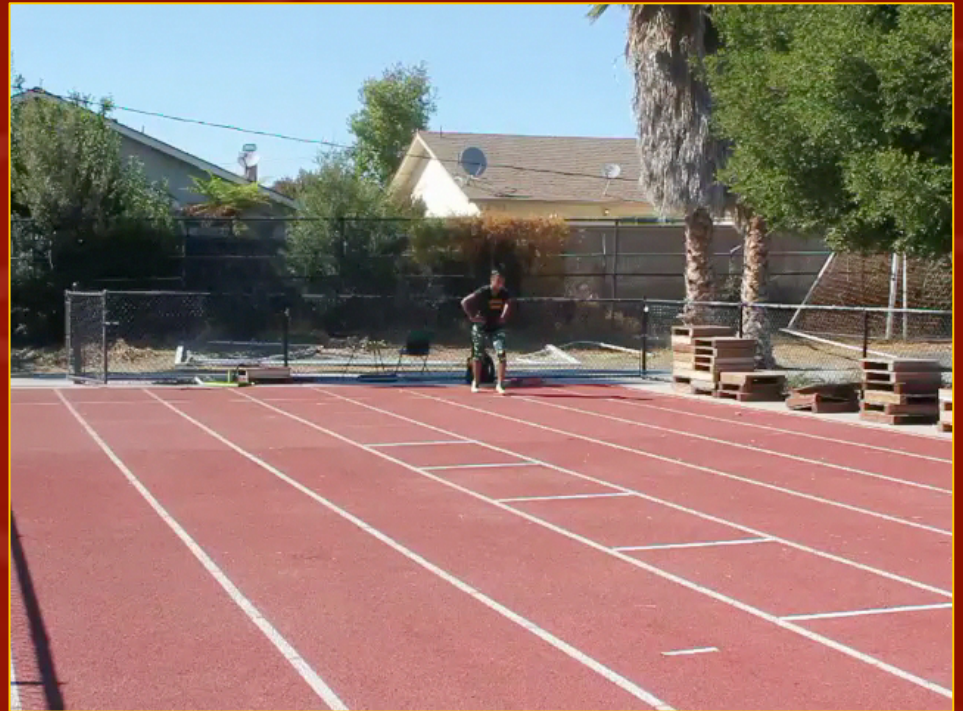
Speed and Over Speed Drills

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Down Hill Sprints



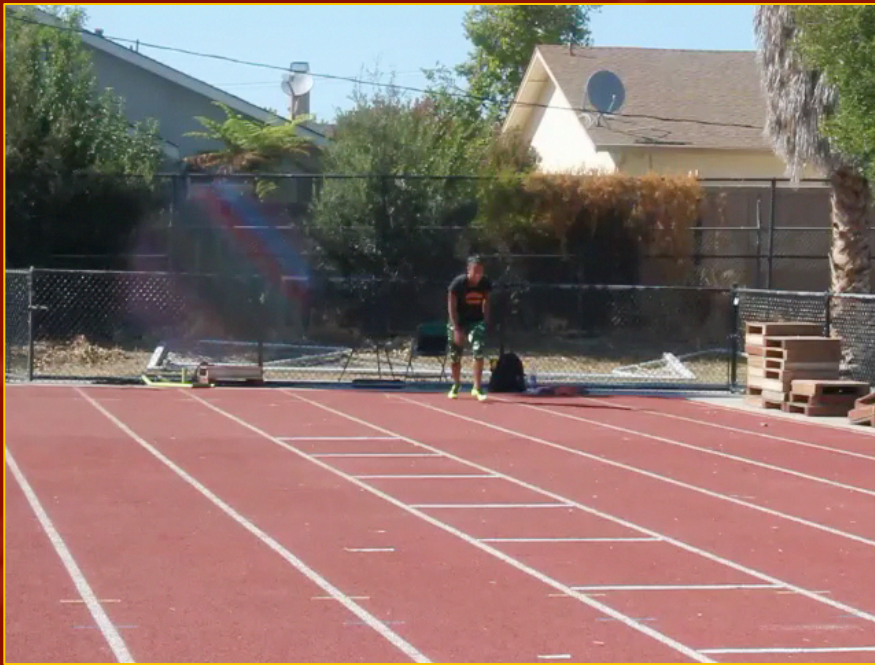
Straight Leg Bounds



Intermuscular & Intramuscular Drills

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Straight Leg Speed Bounds



Speed Bounds



Power = Strength in the context of motion, that the strength is intended to support

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MAX VELOCITY IN A NUT SHELL

- 1. Maximize Time In the Air**
- 2. Minimize Ground Contact**
- 3. Enhance Force Application**
- 4. Vertical Forces Are Dominant**

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TRAINING INVENTORY

- Muscle Activation (Isometric, Functional Movement: Unilateral, Contralateral)
- Strength and Power Development (Isotonic , isokinetic and Olympic Lifts exercises)
- Multi Throws (Medicine Ball Throws and Drills, Shot Throws)
- Plyometricis (Force Application and Absorption drills)
- Acceleration and Max Speed Development (Sprint Drills)

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TRAINING CONCEPTS

- Race Modeling (0-30, 30-60, 60-90, Finish)
- Performance Modeling (Foot Race Drills, Vasalva Maneuver)
- Contrast Training (Acceleration/Max Velocity, Wickets/ Tape / Block Starts)
- Intermuscular and Intra-Muscular development (Speed Drills and Reaction Drills)

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PERFORMANCE & RACE MODELING (Reaction, Acceleration, Transition, Max Velocity, Deceleration)

- Low Heel Recovery exercise w/ Wickets
- Acceleration Tape Drill (inconsistency in performance is a result of inconsistent stride patterns)
- 10m, 20, 30m Timed Sprints, 30m fly's timed
- Half Starts (Intermediate to Top Transitioning)
- Blocks: Transitioning (Bottom to Top Transitioning)

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PERFORMANCE & RACE MODELING (Cues, Patterns, Positioning)

- 10m Block Starts (starter gun used)
- Breathing Patterning: Vasalva Maneuver
- Foot Race exercise (Mental and Physical Poise)
- Acceleration and Max Velocity Wicket Drills (movement patterns)

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CONTRAST TRAINING

- Acceleration Wickets vs. 30 Meter Sprints
- Acceleration Wickets vs. Tape Drill
- Tape Drill vs. 30 Meter Sprints
- Max Velocity wickets vs. 60 Meter Sprints
- Block Start vs. Half Starts (Bottom to Top Transitioning)

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INTERMUSCULAR AND INTRA-MUSCULAR TRAINING

- Seated Foot Fires, Standing Foot Fires
- Foot Claws (Anchor Drills)
- A Skips and A-B Skips
- Speed Skirts
- Straight Leg Shuffles
- Marching Drills
- Frequency Drills
- Fast Leg Drills
- Reaction Drills
- Sledged Skater Drills
- Sledged A-skips
- Sledged Marching Drills
- Speed Squats
- Squat Jumps

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ACCELERATION-STRIDE LENGTH PATTERNING (Tape) Directions: Measure Zero (0) from the front pedal when using blocks. DO NOT measure from start line.

series	0	1	2	3	4	5	6	7	8	9	0	11	12	13	14	15	16
2A	2-11	6-3	10-0	14-2	18-8	23-6	28-8	34-1	39-9	45-7	51-7	57-8	63-10	70-1	76-5	82-9	89-1
2B	3-0	3-6	10-5	14-9	19-6	24-7	30-0	35-8	41-7	47-8	53-11	60-3	66-8	73-2	79-9	86-4	92-11
2C	3-1	6-8	10-8	15-1	19-11	25-1	30-7	36-4	42-4	48-6	54-10	61-3	67-9	74-4	81-10	87-8	94-4
2D	3-2	3-8	4-2	4-7	5-0	5-4	5-8	5-11	6-2	6-4	6-6	6-7	6-8	6-9	6-10	6-10	6-10
2E	3-3	3-9	4-3	4-8	5-1	5-5	5-9	6=0	6-3	6-5	6-7	6-8	6-9	6-10	6-11	6-11	6-11
2F	3-4	3-10	4-4	4-9	5-2	5-6	5-10	6-1	6-4	6-6	6-8	6-10	6-11	7-0	7-1	7-1	7-1

ACCELERATION-STRIDE LENGTH PATTERNING (Wickets) Directions: Place 1st hurdle at start line. Measure from crossbar to crossbar of every hurdle

H1	H2	H3	H4	H5	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17
2A	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8
2B	1.25	1.25	1.35	1.35	1.35	1.45	1.45	1.45	1.55	1.55	1.55	1.65	1.65	1.65	1.75	1.75	1.75	1.8
2C	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.9
2D	1.35	1.35	1.45	1.45	1.45	1.55	1.55	1.55	1.65	1.65	1.65	1.75	1.75	1.75	1.85	1.85	1.85	1.9
2E	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	2.0
2F	1.45	1.45	1.55	1.55	1.55	1.65	1.65	1.65	1.75	1.75	1.75	1.85	1.85	1.85	1.95	1.95	1.95	2.0

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Things To Know

1. **Over-Simplify** – Coach and Educator, Vince Anderson of Texas A&M once said “Over-simplify everything, so that if and when you error, its always on the side of simplicity”. Success often comes from doing fewer things more thoroughly.

2. **What is Speed?**- Coach and Educator Tony Veney once said “Speed is a determinant value”. Which means that speed is the factor that will decisively determine the outcome of a race. Neither it or those things that are part and parcel of speed can be ignored (Flexibility, Coordination, Strength, Power)

3. **Teach Part-Part-Whole** - If a student has a problem with reading. You're not going to give him/her more books to read. What sense would that make. Instead we would identify the problem and whether its spelling, pronunciation, word identification, or language comprehension. We break it up into parts (small actions) improving in those areas before putting it all back together. Putting a -operator at the wheel.

So if your athlete has a problem with running, you don't give them more running to do because that wouldn't make sense either.

4. **½ Science * ½ Art** – Sports is not an exact science. Part of it is art. But the more you understand the science of it the better the artist you become. Read, Ask Question, Experiment. Become student of the sport learn and understand what you're doing and why. Don't let your athletes talent become debilitated because of your deficiencies.

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Things To Know

1. **Natural and Responsible progression of activity** – **Natural** similar to the exponential growth we see in children as they grow older and bigger. Nothing rushed .. However; there is this sense of urgency to do the important things up front. **Responsible** as in Moving and developing towards a more advance state

2. **Sensitive Period of Physical Development:** - age range sensitivity for certain physical performance factors. These are the most suitable periods for the development of Strength, Power and Speed capacities.

- Being aware of these critical/sensitive periods and the optimal training affects, allows us to guide the developmental procedure.
- Example: development and Fixation of movement patterns and functions. A poor oversight at a critical stage and sensitive period can lead to bad formulations of movement functions. (**College and Remedial Training**)

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AGE	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Boys	-	4.0	7.6	17.5	23.4	19.9	14.7	12.9
Girls	11.8	20.5	19.2	9.5	12.6	9.5	16.7	-

TABLE 2: Annual percentage increases in the back strength of the tested subjects (% of the total increase)

STATIC STRENGTH: During a 2 year period (11-12 and 12-13) the static strength showed an improvement of 39.7%

AGE	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Boys	-	6.8	14.0	18.8	18.9	16.7	13.0	11.8
Girls	28.5	53.4	2.3	8.7	4.2	2.3	0.6	-

TABLE 3: Annual percentage increases in the standing long jump of the tested subjects (% of the total increase)

POWER: During a 2 year period (10-11 and 11-12) the standing long jump showed an improvement of 81.8%

AGE	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Boys	-	0	20.0	20.0	20.0	20.0	20.0	0
Girls	50.0	25.0	25.0	0	0	0	0	0

TABLE 6: Annual percentage increases in the running speed (m/s) of the tested subjects (% of the total increase)

SPEED: During a 2 year period (10-11 and 11-12) speed showed an improvement of 75% and 100% over a 3 year period.

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In Closing

Our Emphasis on Teaching: Its not so much the activity or workouts that a coach uses in training, but it's the teaching that goes into the session and how its received by the athlete that's most important. We have to be careful to get the athlete to trust us and use models, images, video ..etc

“To convince them of the need to Learn – Adjust – Improve”