

Race Modeling for Long Sprints: Philosophy & Training Strategies

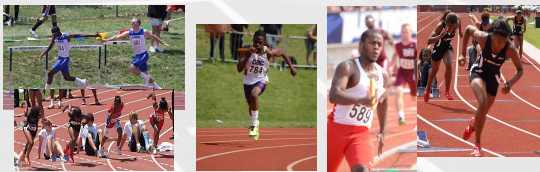
Presented by
Nick Buckvar

Ladue High School, St. Louis, MO

When is race modeling implemented?

Competition Phase: focus is more on racing & evaluation

- Energy system focus shifts to more race specific speed
 - we have base: workouts can now be close to full intensity
- Race modeling (*what the race feel likes, rehearse the plan*)
- “The hay is in the barn”
- “Money is in the bank”



Rehearsing a Race Strategy is Critical

- We have a plan for training, therefore we should have a plan for making the training work in a race
- Understand & teach what running the 400m *feels like*, as opposed to what it's supposed to *look like-practice the feeling*
- Keep the in-race queues simple & motor response oriented
- React & respond in races, not think & try
- Be adaptable: Consider the strengths & weaknesses of the athlete when developing a race plan
- Understand track markings: universal visual keys
- *Don't waste days during the season: race modeling must also be a workout*

400m: Defining the event

- The 400m dash can best be defined as a **controlled** sprint that requires strength endurance
- The 400m Dash is unique in that during the course of the race, the athlete will cycle through several energy systems (CP/ATP, speed endurance, extensive & intensive tempo, anaerobic threshold, lactic threshold)
- Because of this, it is often challenging to design an effective race plan: missing pieces

Basic Sprint Training Lingo and Terms

- **Speed Development**- Acceleration is developed first, followed by Maximum Velocity
- **Speed Endurance**- ability maintain *near* max velocity
- **Lactate Tolerance**- AKA Lactate Threshold; the ability to buffer the acid build up in muscle tissue due to high level physical activity (time & intensity dependent)
- **Anaerobic Capacity**- How much energy you access from the anaerobic energy systems (all of the above)
- **Aerobic Capacity**- How much energy you access from the aerobic energy systems

3 Main Energy Systems of the 400m



- CP: 87-100% efforts
 - Est. the tempo & speed to maintain (start of race through 60-120m)
- Anaerobic Lactic: (Glycolytic) 80-90% efforts (150m-320m)
 - Effects of lactic build up occurs around 40 seconds @ high intensity
- Aerobic: 55-80% efforts
 - Needed for the ability to maintain a tempo even after effects of lactic build up (last 200m of the race)

ENERGY SYSTEMS:

Race Modeling workouts will involve multiple energy systems

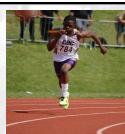
Two Simple Categories for Planning & Organizing Workouts

| ATP-CP Work | Daily Volume (meters) | | Intensity (% of max effort) |
|-------------------------------------|-----------------------|-----------|------------------------------|
| | In season | Preseason | |
| Speed Development (Max Velocity) | 400-500m | 500-700m | 90-98% |
| Speed Development (Acceleration) | 500-700m | 700-900m | 90-98% |
| Speed Endurance | 600-1000m | | 93-97% |

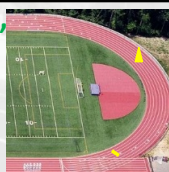
| Specific Energy System Work | Daily Volume (meters) | | Intensity (% of max effort) | |
|---|-----------------------|------------|-----------------------------|-----------|
| | In season | Preseason | In season | Preseason |
| Special Endurance I (long anaerobic Power) | 1300-2000m | 2000-3000m | 75-93% | 70-85% |
| Special Endurance II (lactic acid tolerance) | 1000-1800m | 1300-2000m | 85-93% | 80-90% |
| Extensive Tempo (aerobic capacity) | 1200-2000m | 1400-2000m | 77-88% | 70-75% |

400m Race Plan

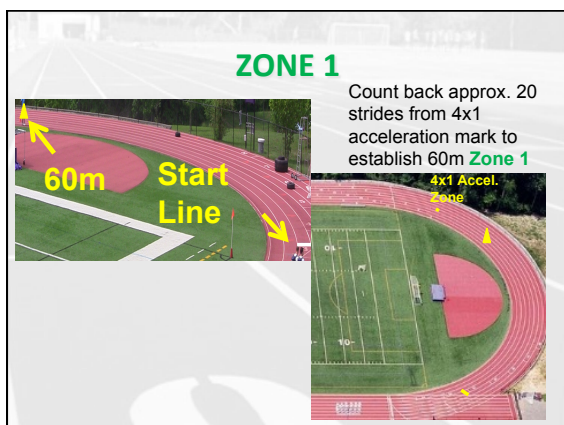
- Simplify the race: spread out the effort
 - 400m: peanut butter on bread, SPREAD IT OUT EVENLY
 - Driving on the highway (accelerate & cruise control)
 - Simple Math to achieve the goal (first 200= 200 PR +1.5)
 - **BOYS:** 49.5= 23.6 + 25.9 **51.0=** 24.6 + 26.4
 - **GIRLS:** 56.7= 26.4+ 30.3 **60.0=** 27.5 +32.5
 - 22.7 + 24.8 = 47.5
 - 3 Zone Race Plan: *Vern Gambetta*
 - **Zone 1: “Set Up”**, use the CP system (blast first 60m)
 - **Zone 2: “Float Fast”**, hold TEMPO est. first 60m, don’t push or press
 - **Zone 3: “Own the Finish”**, all about technique and tempo
- ** use markings on the track as visuals- race visualization**

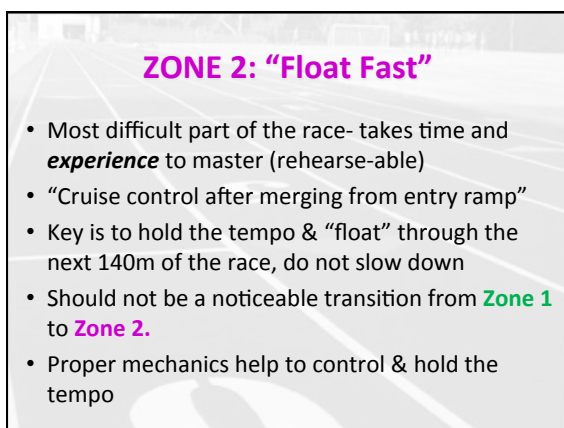


ZONE 1: “Set Up”



- Start to 60m
- Main purpose: establish the tempo for the race
- CP System is free energy, use it or lose it
 - 5-7 seconds before complete fatigue of the system
 - “Blast the first 60m”: proper acceleration and drive mechanics (Accelerate onto the highway)
 - Scary for kids to think this way
- Avoid accelerating with too much effort (not 100m) and too long into the race

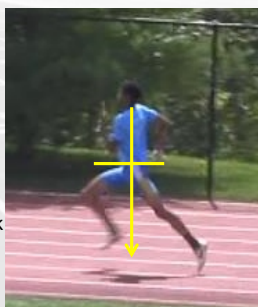






ZONE 2: Mechanics

- Tall from the toes, shoulders forward-from feet, quick elbows
- Angle of Hips (level)
- proper arm carriage (hands/ thumbs up)
swing cheek to cheek
- Queue knee, toe, heel up together in all drills & MONITOR ALL DRILLS



Zone 2: Mechanics & Technique

April 2014

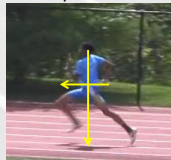
- Hips are down
- Shoulders back
- Hands/arms cross body



49.5

June 2014

- Hips are level
- Tall, shoulders forward
- Arm carry: hand levels

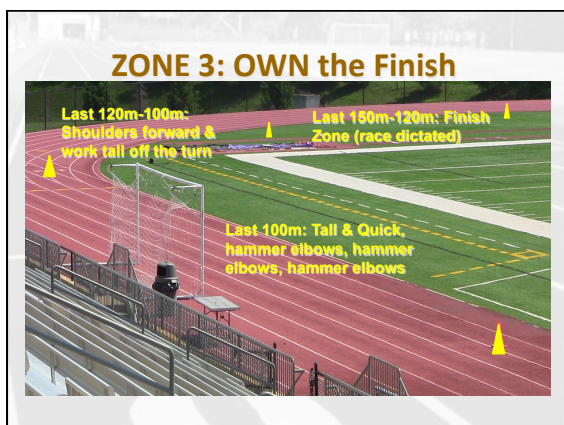


47.9

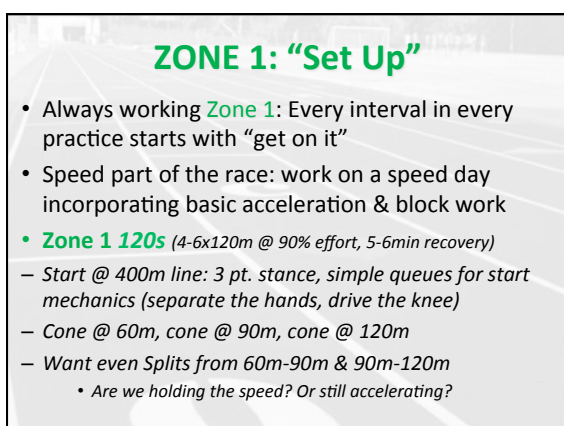
Zone 3: OWN the Finish

- Last 150-120m of the race
- All about maintaining tempo!!!
- Sacrifice stride length to keep frequency
- GREAT Technique: TALL & QUICK !
– Tall, shoulders forward, hammer the elbows, **RELAX**











ZONE 2: "Float Fast"
220s workout

- **Zone 2** 220s: Speed Endurance workout (hold the speed from **Zone 1**)
 - 3-5x 220m @ 87-93% effort, 8 min recovery
 - 220m so that we run through the first 200m comfortable and aim beyond, hold the tempo for 120m
 - Looking for Even 50m splits after **Zone 1**
 - Begin @ 400m start line, cones @ each 50m
 - Accelerate first 60m, then split the 50s
 - Are we holding the speed?
 - Still accelerating?



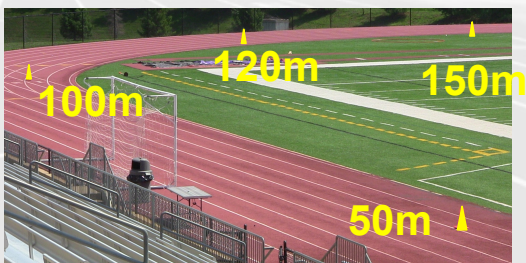
Video session

- 3-4x220s @ 90%
- 47.5 400 Goal Pace
 - 23.6 as pacing guide....but HOW we do it (let's watch)
 - 23.8 @ 200m
 - Zone 1: 6.9 @ 60m
 - Zone 2: 11.85 first 100, 11.9 second 100
 - (even 50s on the back stretch 5.9 & 6.1)

Zone 3: "OWN the Finish"

- Last 100 is trainable, therefore rehearse-able
- Every interval in a workout is an opportunity to work **Zone 3**: Last 50m of every rep "tall & quick"
- Repeat 200s @ backend race pace (Half Tracks) 5-8 reps work down from 3min rest to 1:15 if possible
 - Cones @ last 150m, last 120m, last 100m, last 50m
 - Let the athlete experiment with their "go mark" somewhere between last 150m & last 120m
 - Locking in the pace of the last 200m of the race so the body can replicate pace when tired
 - Progress the workouts if needed (100s, 180s, etc.) replicating the **tempo when tired is the key**

ZONE 3: OWN the Finish



Video session

- Last 100m, back down on the gas pedal
 - Arms/ elbows are the gas pedal
 - Hammer the elbows back
 - Tall & quick!
 - Tall from the toes
 - Shorter is quicker, quick arms=quick legs
 - Lets take a look...

Staple Workout zone 3

- MUST have a repeat 200m progression workout in the plan: trains the backend pace
- **Backend 200m Pace:** the pace you want them to run the last 200m of the race in.
 - Take into account the “fly” aspect (.8 seconds)
 - End of March: up to 2200m @75% 2:30-3min rest
 - End of April: up to 1600m @ backend pace 2-2:30 rest
 - Last 3 weeks of May: 800-1200m @ goal backend pace 1:15-1:30 rest (5x200m avg. 25.6 standing = on 24.8 fly)

Full Race Modeling: Event Specific Endurance

- **Event specific Endurance:** blends all of the energy systems required for the event
- In order to get faster, the athlete must expand the energy systems used during the 400m: must work all energy systems together and **FEEL** what the race is like
 - Simulates the paces and physiological effects
 - Mental focus of running the event
- Focus is **how** we run it, **how** we get there, not just what the watch says (coaches splits only)
- 900m-1200m worth of total work per session @ 85-93% intensity

Full Race Modeling: 320s

- 3-4x320m @ 85% with 8-10min recovery
- The interval is long enough to cover all 3 Zones
- Short enough to push to the edge of the total fatigue barrier, but not go too deep given the intensity & distance
- Focus is on **how** we get there not just hitting the time (still base off target time to ensure workout accuracy)

Full Race Modeling: 320s: Event Specific Endurance



Video session

- 3-4x320s @ 85%
- 47.5 400 Goal Pace
 - 39.5 @ 300m as pacing guide....but HOW we do it (let's watch)
 - 25.3 @ 200m, 38.8 @ 300m
 - Zone 1: 7.3 @ 60m
 - Zone 2: 12.3 first 100, 12.9 second 100
 - (even 50s on the back stretch 6.3 & 6.6)
 - Zone 3: Good arm action, good posture off the turn
 - hammered back with elbows
 - Tall from the feet and shoulders forward

Full Race Modeling: Stacked Interval Workouts

- Stacked workouts: breaks up the distance into intervals
 - 2 big intervals with a middle flush session
 - Middle flush session allows the body to buffer the lactic accumulation (mental and physical flush)
 - Teaches body it can perform with the LA accumulation
- 2 sets (220m-4x50m-180m) @ 90%
 - 220m-rest 8min-4x50m 45 sec rest-6min rest-180m
 - 12min between the sets
 - 220s are **Zone 1** & **Zone 2**..... 180s are **Zone 3**

Full Race Modeling: Stacked Workout: Event Specific Endurance



Stacked Workout cont'd.

2 sets (220m-4x50m-180m) @ 90%

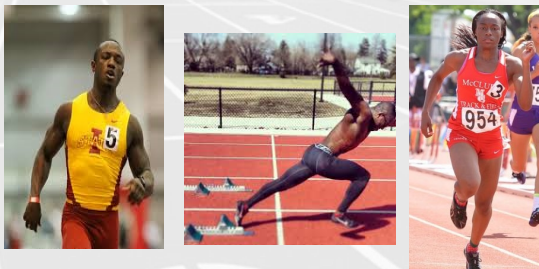
220m: **Zone 1: Set up & Zone 2: Float Fast**

- Est. the pace
- Transition from accelerating to floating
- Get through the first half of the race according to plan
- Coaches split points @ 100m, 150m, 200m checking for even splits

180m: **Zone 3: Own the Finish**

- "Fly" into the last segment of the race
- Determine their own "go" point
- Transition off the turn tall, arms quick, shoulders forward
- Last 100m should be at race pace

200m Dash Race Modeling



200m: Defining the event

- The 200m dash can best be defined as a pure sprint that requires a great amount of strength to hold intense levels of speed
- **200m** dash Purely Anaerobic
 - ATP/CP systems:
 - **Speed Development: Acceleration & Max Velocity**
 - Critical in **Speed Endurance**

200m Race Plan **80-20-100**

- **80m acceleration & build**
 - Traditional 100m acceleration mechanics & drive phase
 - After drive phase continue to be quick and powerful w/ arms around the turn, down on the gas pedal
- **20m float zone (varies by athlete)**
 - It's not a race to the straight away, must conserve energy @ some point in the race
 - Hold the speed, no more gas: be tall and quick into the zone
- **100m build & hold**
 - Build w/ powerful elbows firing back (not an actual re-accel.)
 - Last 50m: maintenance phase, stay quick & relaxed

200m Race Plan



Start through Float Phase Work

- 80s on the turn: on a Speed Day
- Start the session with block work
 - EX: 3x20m, 3x30m
- 4-5x80m reps @ “race pace” or race simulation with 8 min rest
- Start 20m **into** the race in a 3pt stance
- Build/ Accelerate for 60m, then hold even for 20m segment
 - Should see a difference in arm action

Start through Float Work



Float Zone and Build Zone

- Flying 120s: on a Speed Day
 - 5 reps @ 87-90% 7-9min recovery: fast but under control to work the zones
 - 10-15m fly zone to build up speed
 - Float through the 20m zone, build for 50m, maintain for 50m
 - Even last 50s (should not be all out)

Float Zone and Build Zone



Videos

- Pasley-Lindberg: bad tech last 100
- Pasley- Sect. tight last 100 (49.2)
<https://www.youtube.com/watch?v=1FnS4pRPWuk>
- Dom: Wash U- not enough early
- Dom: not enough early-pushes through float zone
<https://www.youtube.com/watch?v=3tTzF2gK3wo>
- Dom: even racing State
<https://www.youtube.com/watch?v=K0708VLzSZA>

Closing Thoughts & Comments



- Do everything with a purpose!
- Understand & teach athletes what running/competing in each event feels like, as opposed to what it's supposed to look like
- Don't be afraid to try something new
- Inspire your athletes to dream & think BIG by showing via simple math how they can achieve their goal times
- Be prepared to make adjustments to your sessions on the fly
- Give your athletes constant feedback during workouts including motor response queues that are transferable to races
- Have fun!!!

Got more questions?

- Contact me at:

npbuckva@gmail.com
