



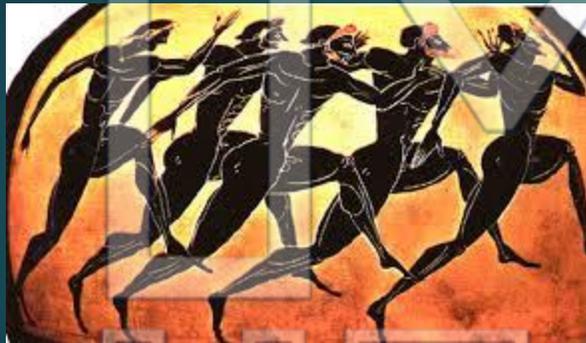
400 meters

Mariane Bacelar, Mason, Briles, and Paulo Mesquita

Background on 400m

▶ 400 meters timeline

Ancient Olympics
– “Diaulos”



Olympic Games
(Women) - 1964



Olympic Games
(Men) - 1896



Olympic (1996)
and World's
(1999) Record –
Michael Johnson



Bioenergetics

- ▶ Men's World Record: 43.18
- ▶ Women's World Record: 47.60

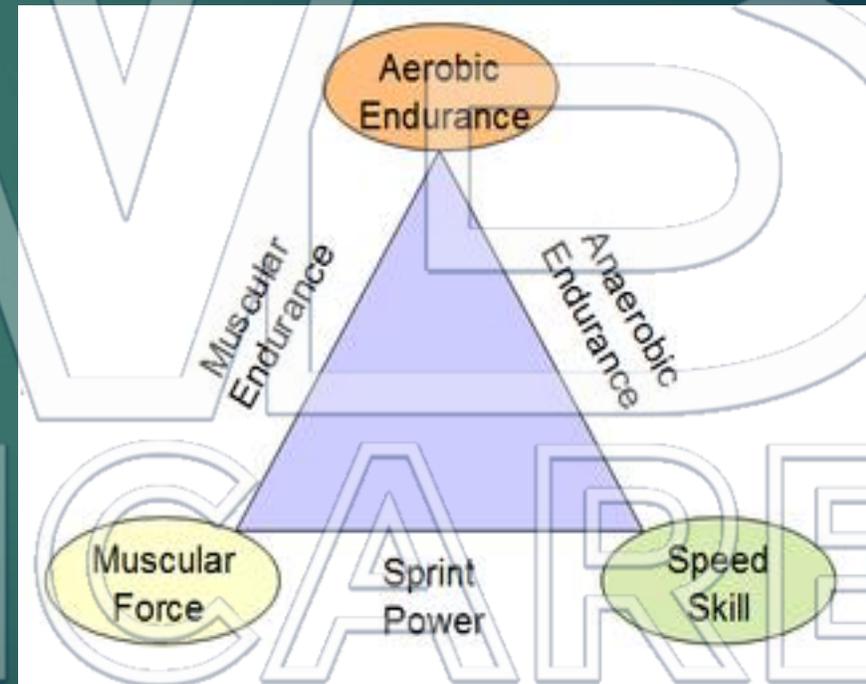
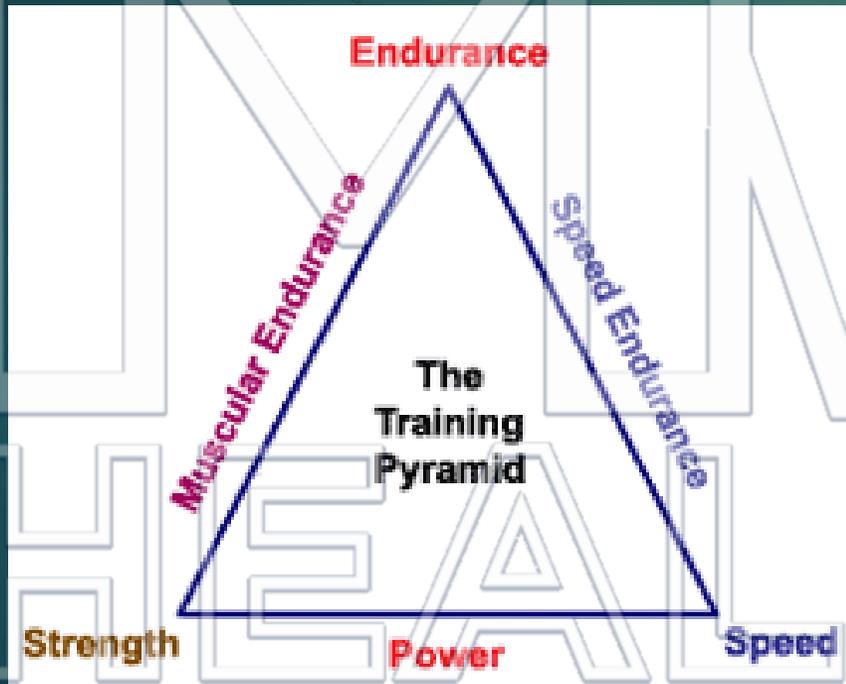
PC System

Anaerobic Glycolytic System

HEALTHCARE

Basics

Important Aspects



Basics

- ▶ Power
- ▶ Strength
- ▶ Sprint Speed
- ▶ Endurance Speed
- ▶ Reaction Time
- ▶ Fatigue Resistance

HEALTHCARE

On the Blocks

- Front leg approximately 90 degrees
- Rear leg approximately 120 degrees
- Hip angle should be approximately 45 degrees

Off the Blocks

- Force comes from driving off the front leg
- Front arm rises at 90 degree angle

Opening Strides

- Forward lean the first twenty meters
- Once upright, head should not bob, remains level



Early, Mid and Late Stages of Flight

- ▶ **Early:** Push off with back leg, eccentric movement of the hamstrings (when hamstring tears happen)
- ▶ **Mid:** Basically in flight, high knee drive
- ▶ **Late:** Landing, plantarflexion and knee extension to absorb shock



Injuries

- ▶ Most common injuries to sprinters is to the hamstring muscles
 - ▶ Semimembranosus
 - ▶ Semitendinosus
 - ▶ Biceps Femoris
- ▶ Pulls and tears are often due to muscular imbalances combined with power movements.
 - ▶ Three hamstrings muscles pair with four quadriceps muscles for naturally unbalanced agonist-antagonist pair
- ▶ Too many people over train their quadriceps and while undertraining their hamstrings, adding further to the imbalance.



Types of Strains

Grade 3
(avulsion)

Grade 1
(pull)

Grade 2
(partial tear)

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Preventative Training

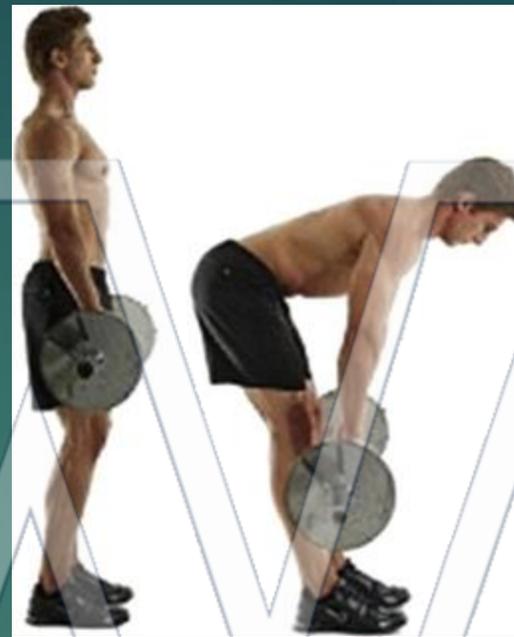
▶ Knee flexion

- ▶ Leg curls – prone, standing, and seated

▶ Hip extension:

- ▶ Romanian deadlifts
- ▶ Good mornings

Basically just don't forget about your hamstrings if you are a sprinter!!!!



Main Exercises

- ▶ **Strength:** Squat, dead lifts, bench press, bent over rows, shoulder press, calf raises;
- ▶ **Power:** power lifts in general;
- ▶ **Plyometrics:** box jumps, single leg jumps, depth jumps, jumps with horizontal displacement;
- ▶ **Sprints:** ATP-PC, AN Glycolytic, block starts, assisted/resisted running;

Periodization

- ▶ OFF-SEASON
- ▶ PRE-SEASON
- ▶ IN-SEASON
- ▶ POST-SEASON

HEALTHCARE

Off-season

Build the foundational base of the athlete.

- ▶ High Volume
- ▶ Moderate intensity progressing to high intensity
- ▶ Weight training: 4x weekly, general endurance progressing to strength
- ▶ Core: 3x weekly
- ▶ Technique: 3x weekly
- ▶ Runnings: “Endurance”/ AN Glycolytic

Off-season

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Weights	X	X		X	X	
Core	X		X		X	
Flexibility	X	X	X	X	X	X
Technique		X		X		X
Plyometrics						
ATP-PC		X		X	X	
AN Glycolytic	X		X		X	
Fartlek						X

Pre-season

Start working more specifically, developing power and the AN system

- ▶ High volume decreasing to moderate
- ▶ High intensity
- ▶ Weight training: 3x weekly, strength + power
- ▶ Core: 3x weekly
- ▶ Plyometrics: 3x weekly
- ▶ Technique: 3x weekly
- ▶ Runnings: AN Glycolytic / ATP-PC

Pre-season

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Weights	X		X		X	
Core		X		X		X
Flexibility	X	X	X	X	X	X
Technique	X		X		X	
Plyometrics		X		X		X
ATP-PC		X		X	X	
AN Glycolytic	X		X		X	
Fartlek						X

In-season

Maintenance

- ▶ Low volume
- ▶ High intensity
- ▶ Weight training: 2x weekly, strength + power
- ▶ Core: 2x weekly
- ▶ Technique: every day
- ▶ Runnings: event specific, 400m with full recovery

In-season

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Weights		X		X		
Core		X		X		
Flexibility	X	X		X	X	
Technique	X	X		X	X	
Plyometrics	X				X	
ATP-PC		X			X	
AN Glycolytic	X			X	X	
Fartlek						

Post-season

Active rest/recovery

- ▶ Low volume
- ▶ Low intensity
- ▶ Runnings + swimming

HEALTHCARE

Post-season

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Running	X				X	
Swimming			X			

HEALTHCARE



MWB

HEALTHCARE

THANK YOU!