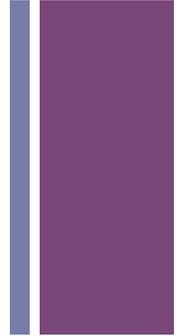


# 7<sup>th</sup> European Pole Vault and High Jump Conference

Köln, Germany

November 12, 2016

# + Physical Preparation of Male and Female High Jumpers



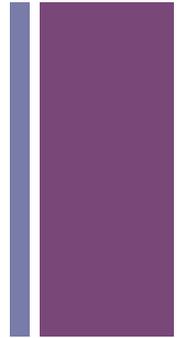
## I. Introduction

- A. Goal is to achieve success at elite level: Achieving A standards, making World Championship / Olympic Teams, qualifying to the finals and ultimately competing for medals
  
- B. Personal Experiences
  - 1. Athletes who spent time in our University program coming from the high school, community college or transferring from another Division I program. (Teaberry, Wentland, Dykstra, Treasure, Jones, Margalit, Broxterman, Leeper, Lancaster, Sellers, Kynard)
  - 2. Post collegiate athletes who did not attend our University (Nieto, Hemingway, Rovelto, Williams)



- C. Success in the summer is a direct result of the quality of the training load in the fall/winter
  1. Relationship between technical development and biomotor development. Quite simply the athlete must first have the physical capability to perform the requisite skill.
  2. There are no shortcuts! Gifted athletes may jump high but will not likely jump high consistently and when it matters most if sound biomotor development and technical skill progressions are not adequately addressed.
- D. I believe that the approach and the takeoff mechanism are the most critical skills in the high jump.

In this presentation I will concentrate on the approach and takeoff mechanism and the prerequisite skill sets necessary in building an effective approach and takeoff.



## + II. Approach

### A. Objectives

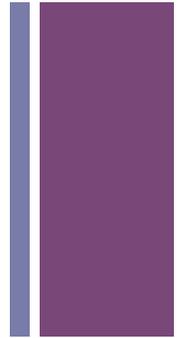
1. Consistency
2. Build to optimal velocities running over an optimal arc

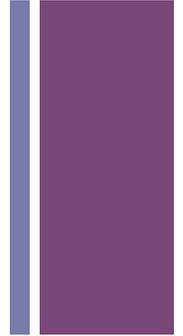
### B. By running over an arc the athlete is able to achieve two desired outcomes

1. The resultant lean away from the bar enables the athlete to leave the ground with a “more” vertical inclination
2. The athlete’s center of mass can be lowered without compromising postural integrity

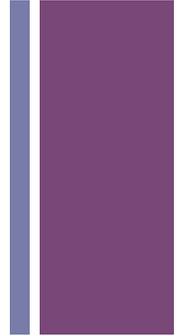
### C. The faster the athlete runs over the arc the greater the lean and the lower the center of mass.

1. Limiting factors will be strength and the speed capabilities of the athlete
2. The speed capabilities are significantly influenced by proper running mechanics

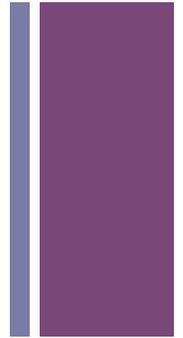




- D. Building an effective approach then requires the following skill set
  - 1. Ability to overcome inertia efficiently and accelerate in a uniform manner
    - a. Pushing mechanics characterized by low, elliptical heel recovery, acute shin angles and near complete hip extension and big arms
    - b. Efficient and consistent acceleration is important in the high jump due to the relatively few number of steps in the approach and the critical need for accuracy



2. The athlete must also possess effective maximal velocity mechanics
  - a. Erect posture
  - b. The athlete's shin angle should be perpendicular with the ground and the feet should contact the ground in a dorsiflexed position under the hips. Heel recovery will be cyclical and emphasis shifts to more front side mechanics as force is applied vertically to the ground
  - c. Efficient force application will facilitate a smooth transition into the curve



3. The athlete must be able to run effectively on a curve
  - a. Efficient ground contact will facilitate effective force application
  - b. Hip axis and shoulder axis must remain in natural alignment and perpendicular to the direction of the run



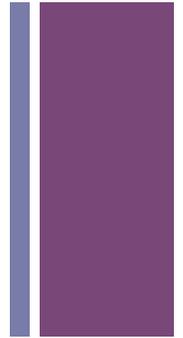
### III. Takeoff Mechanism

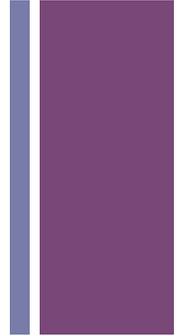
#### A. Objective

1. To convert the horizontal velocity developed in the approach run to vertical velocity at takeoff
2. The athlete must apply a large force through as great a range of motion as possible in a short a period of time as possible

#### B. The penultimate step

1. The athlete will contact the ground flat footed keeping the hips moving as level as possible over the foot so as to prevent the center of mass from dropping onto the takeoff
2. It is important to keep the torso erect while moving over the penultimate foot





C. The takeoff step

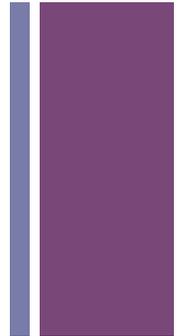
1. The athlete will recover the heel of the takeoff leg well below the knee of the penultimate leg while moving over the penultimate foot
2. The takeoff leg will be fired into the ground well in advance of the center of mass utilizing the glutes and hamstrings
3. The quadriceps will be isometrically contracted assisting in stabilizing the knee joint and facilitating a strong eccentric contraction at takeoff

D. The takeoff mechanism can be described as a push-through-pull action



E. Creating an effective takeoff then requires the following skill set

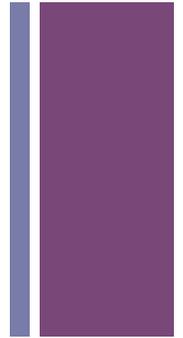
1. (a) Ability to maintain an erect posture with the torso, (b) with the hips remaining low, (c) while moving (quickly) over the penultimate foot in single support
  - a. Mechanics of foot strike of penultimate
  - b. Core stability
  - c. Balance
  - d. Leg strength
2. Amortization considerations while executing the takeoff mechanism
3. Postural integrity – dictates order of firing
4. Ability to maintain proper hip/shoulder axis relationships particularly with respect to the longitudinal axis of the takeoff foot

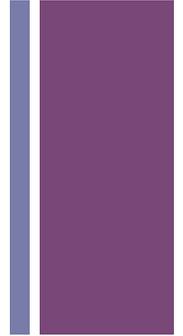




#### IV. Personal beliefs with respect to training of genders

- A. Females are able to handle significant volumes of work, comparable or even more than some males
- B. Females certainly can handle similar intensities but not as much of it as males
- C. It has been our experience that we need to keep women's volumes higher particularly in the weight room during the competitive phase as compared to the men
- D. Tapering is an individual consideration, however to generalize we will unload volume with males keeping intensities high and with women we will not unload volume as much but we do reduce the amount of high intensity work somewhat





## V. Summary of Foundational Beliefs

### A. Individualized training is essential

1. Strengths / Weaknesses
2. Training Age
3. Gender

### B. Basics are most important

1. General - Specific
2. Simple - Complex

### C. Prerequisite skill sets must always be addressed to some degree