Biomechanical Approach to Javelin Throwing

Kellie Fegter & Blake Vajgrt
December 5, 2012
HHP 395 Biomechanics
Objective

The goal is to maximize range of javelin. This is done by sound technique and optimizing release speed and angle.
Reaching Optimal Performance

- Release Velocity
- Release Angle
- Sequence of Hip and Shoulder Rotation
- Explosive Nature of the Throw
A Step by Step Approach to Javelin

- Stage 1 – Runway
- Stage 2 – Drawback
- Stage 3 – Throw
Runway

The purpose of this stage is to build horizontal velocity for release.

- Movement occurs in the Sagittal Plane
- Primarily Flexion and Extension of the Hip, Knee, and Ankle
- Main Muscles used include Quadriceps, Hamstrings, Gastronemius, Iliopsoas and Gluteus Group.
Runway

Common Errors:
- Low Knee Drive
- Large Angle of Attack
- Faulty Running Form
Drawback

The purpose of this stage is to transfer horizontal velocity and store it as potential elastic energy.

- Movement Occurs in the Frontal and Transverse Planes
- Primarily Movements:
  - Horizontal Abduction of Shoulder
  - Extension of Elbow
  - Trunk Rotation
  - Abduction, Adduction, Flexion, Extension of Hip
  - Flexion and Extension of Knee
Drawback

Common Errors:
- Low Cross Over Step
- Lack of Trunk Rotation
- Low Arm & Javelin Position
Throw

The purpose of this stage is to transfer all angular velocity from the joints to the linear velocity of the javelin upon release.

Movement occurs in all planes of motion
Throw – Lower Body

• Primarily Movements
  ◦ Adduction, Abduction, Flexion, and Extension of the Hip
  ◦ Extension of the Knee
  ◦ Plantar Flexion at the Ankle

• Main Muscles used include Quadriceps, Hamstrings, Gastronemius, Iliopsoas and Gluteus Group
Throw – Upper Body

- Primary Movements
  - Horizontal Adduction and Flexion at the Shoulder
  - Extension and Flexion at the Elbow
  - Flexion at the Wrist
  - Trunk Rotation

- Main Muscles used include Deltoid, Pectorals, and Rotator Cuffs
Overview

http://www.youtube.com/watch?v=YAm1JXAtqh4&playnext=1&list=PLC7FE7D63C3B17AEF&feature=results_video
References