Track & Field Technical Certification

An Overview of the Throwing Events

Introduction

Track and Field competitions include four throwing events. They are the Shot Put, the Discus Throw, the Javelin Throw, and the Hammer Throw. This course will concentrate on the glide style of the shot put, the discus throw, and the javelin throw. Instruction in the rotational style of shot put and the hammer throw are available in the supplementary sections of this course. In the following section, we will examine basic technical aspects that all throwing events share.

- **Mechanical Factors Affecting Throw Performance.** Five factors dictate the performance on any given throw, and all technical teaching is geared toward affecting these parameters. These are:
    - **The Implement's Velocity at Release**
    - **The Implement's Angle of Release**
    - **The Implement's Height at Release**
    - **Aerodynamic Factors**
    - **Release Position with respect to the Point of Measurement**

  The velocity at release is the most important of these.

- **Phases of the Throwing Events.** Each of these events is composed of the phases listed below.
    - **The Preliminary Movements**
    - **The Approach**
    - **Arrival in the Delivery Position**
    - **The Delivery**
    - **The Finish**

We will now examine each of these phases in detail. Keep in mind explanations are applicable to right handed throwers.

The Preliminary Movements

Each throwing event contains a group of preliminary movements which prepare the thrower for execution of the throw. These typically include the following.

- **Gripping and Positioning the Implement**
- **Assuming the Starting Position**
- **Rhythmic or Setup Movements**

The Approach

- **Purposes of the Approach**. Each throwing event includes some type of approach. The approach can take different forms (a glide in the shot put, rotations in the discus, or shot put, or a runup in the javelin). In each case, the approach serves three purposes.
    - **Developing Momentum and Velocity**. The approach provides the thrower and the implement with momentum and velocity, increasing the opportunity for good performances.
    - **Insuring an Accurate Delivery Location.** The approach should place the thrower in the correct physical location from which to execute the delivery of the implement, so that proper technique can be used and distance preserved.
    - **Positioning the Body for Delivery.** The approach should place the body in the correct physical positions and motor environment to execute the mechanics of the delivery correctly.
- **Acceleration.** The approach should consist of a gradual, smooth acceleration. It is a common error for a thrower to accelerate too quickly in the approach, only to decelerate later.

- **Posture.** Throwers should demonstrate proper posture in order to achieve the proper body positions for the delivery. The positions and alignment of the head, torso, and pelvis determine the quality of posture and should be constantly addressed.

- **Amplitude of Movement**. The approach should display large ranges of motion and extended body positions. These are more conducive to momentum development.

Arrival in the Delivery Position

- **The Delivery Position.** The delivery position is the position from which the thrower can best execute the delivery of the implement. One purpose of the approach is to place the body in the most effective delivery position. The delivery position of any throw shows certain positions and is subject to certain biomechanical principles, which are discussed below.

- **Biomechanics of the Delivery Position**

    - **Linear and Rotary Motion.** In every throwing event, during delivery the implement travels a path that combines linear and rotary characteristics. Some events feature one more than the other, but both are present in each.

    - **Posture.** Proper alignment of the core of the body is prerequisite to proper delivery of the implement. A proper alignment of the head insures relaxation, balance, and permits a good strike. Dropping the head or turning the head away during the throw are common errors. A neutral alignment of the pelvis with respect to the spine enables relaxation, proper leg function, and effective turning. Excessive bending at the waist upon arriving in the delivery position is a common mistake, placing the pelvis in a forward position.

    - **Setting up a Long Path of the Implement.** The longer we apply force to the implement, the greater the momentum and velocity we can create. To enable a thrower to lengthen the amount of force application time, the path of the implement during the delivery should be lengthened as much as possible. This is done in two ways.

        - **Placing Bodyweight on the Rear Foot**. During the delivery, bodyweight is transferred from the right (back) foot to the left (front) foot, effectively increasing range of movement and the length of the implement's linear path. To

set up this crucial weight transfer, the thrower's weight should be completely concentrated on the rear (right) foot in the delivery position.

- **Closing the Upper Body.** During delivery, the body should turn smoothly in the direction of the throw. Lengthening the path of this rotation provides more opportunity for the thrower to apply force to the implement. For this reason, in the delivery position, the body should be turned away from the direction of the throw to some degree.

- **Adjusting the Stance to Set Up a Block.** Momentum that is created in the thrower's body must eventually be stopped so that it can be effectively transferred to the implement. This is done when the left leg plants firmly in the delivery position, stopping the horizontal and rotational movement of the thrower's body. In these throwing events, the feet in the delivery stance are located approximately in line with the direction of the throw and the thrower's direction of travel. This alignment of the feet enables the left leg to perform this blocking function.

- **Separation.** During delivery, the body must turn smoothly in the direction of the throw. However, the upper and lower bodies do not turn from the same positions at the same time. In the delivery position, the shoulders are rotated farther from the direction of the throw than the hips. This relationship of the hips and shoulders is called separation, referring to the separation of their respective axes. In these throwing events, the delivery positions show the hips aligned 90 degrees from the direction of the throw, and shoulders closed even more.

The Delivery

This phase consists of movements of the throw itself, beginning upon arrival in the delivery position. The delivery is comprised of movements of the upper and lower bodies. The movements of the upper body are called the strike. Following are biomechanical principles governing the delivery.

- **Consistent Acceleration of the Implement.** Acceleration of the implement must be consistent and positive. Accelerating the implement too quickly initially, only to decelerate later is a common error.

- **Summations of Forces.** Upper body activity in delivery and the strike should result from a summation of forces. Large muscles of the legs and torso initiate the movement and overcome

inertia, so that the smaller muscles of the shoulders and arm can contribute effectively later. Each throw differs slightly, but proximal to distal joint firing sequences must be preserved.

- **Transfer.** During delivery, the bodyweight should transfer smoothly from the rear (right) foot to the front (left) foot, lengthening the implement's linear path.

- **Turning.** During delivery, the body should turn smoothly from a closed position until the thrower is facing the direction of the throw.

- **Lifting.** During delivery, the legs extend, lifting the implement and contributing to vertical force production.

- **Torque.** Throwers initiate the turning of the lower body prior to the turning of the upper body. This creates a twisting of the core of the body called torque. This torque creates stretch reflexes in the torso musculature, enabling greater subsequent acceleration of the implement.

- **Blocking.** In throwing, momentum that is created in the thrower's body must eventually be stopped so that it can be effectively transferred and imparted to the implement. This is done in two ways.

    - **The Left Leg Block**. The left leg plants firmly in the delivery position, stopping the horizontal and rotational movement of the throwers body. This accelerates the throwing side and transfers momentum to the upper body and implement. Proper alignment of the feet is essential to proper blocking.

    - **The Left Arm Block**. The left arm should move in close to the side of the thrower as the delivery is initiated, assisting in stopping the left side of the upper body. This accelerates the throwing side and transfers momentum to the implement. This block should not include a backwards movement of the body's left side, but solely a stopping of the upper body's rotation as forward movement continues

The Finish

The Finish consists of the parts of the throw performed after the implement has been released.

- **Mechanics of the Finish.** No force can be applied to the implement after it is released, so at release the throw's distance is predetermined. However, the finish is important because the

thrower must redirect momentum to prevent fouling. Also, throwers who do not finish correctly typically lose distance because the delivery is altered in anticipation of the poor finish.

- **Parts of the Finish**

  - **The Follow Through.** The follow through is comprised of the continued motion of the throwing arm after the implement has been released.

  - **The Reverse**. The reverse is a maneuver that enables the thrower to follow through, and maintain or regain balance after the throw is completed to prevent fouling. While it varies from event to event, it typically involves adjusting the stance and torso.