

SPECIFIC EXERCISES FOR DISCUS THROWERS

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Specific exercises that are related to the actual throwing technique play an important role in the learning and development of technique and specific strength in the discus throw. In the following text the authors outline the methodical background of specific exercises and list a number of suggested introductory and preparation exercises. The article is a slightly abbreviated translation from Legkaya Atletika, Moscow, No. 6/7, June 1992. Re-printed with permission from Modern Athlete and Coach.

Exercises that aim to acquire a certain movement combination are known as specific preparation exercises. They are closely related to the structure of the basic movement coordination of the competition exercise or reflect one or several elements of it. It is important that specific exercises include elements that resemble the internal and external action of the competition performance. Exercises that are based on an interactive development of specific strength and movement acquisition, and can be practically regulated, are therefore called specific preparation exercises. They allow to improve considerably both the physical and the technical level of discus throwers.

Coaches can select from a variety of recommended exercises the most suitable and effective ones for the learning and development of the discus throw technique and specific strength. Exercises that assist in the improvement of the turning positions and the muscular tension during the key moments of the rotation are particularly effective. Although the use of specific exercises is universal, their training effect is gradually reduced as an athlete's performance qualifications improve. Despite this fact, specific exercises are still beneficial for high performance throwers in improving their technical elements, specific strength and specific coordination. All these factors are extremely important in the rotational movement structure of the discus throw.

Specific exercises also involve the throwing of different implements. This takes place in the winter indoors into a net. The weight of the implements should allow for a technically correct performance. The number of repetitions of an exercise is set according to the throwers technical ability and preparation levels. The coach has to find the weak links in the athlete's technique and strength preparation for the correct choice of exercises in order to eliminate the shortcomings.

The nature of the introductory and preparation exercises becomes clearer when the importance of the basic phases and positions of the rotational discus throw technique in learning and training is understood. The exercises, as far as the

technique is concerned, must contain elements that are transferable to the movements of the competition performance. Consequently the chosen exercises should be based on the key positions of the throwing action to make the evaluation of their biomechanical effectiveness possible. These include the position at the start of the turn, the single support phase, the unsupported phase, the final single support phase and the position at the start of the delivery.

Every position in this rotational movement is characterized by the placement of the athlete's body segments in relation to the throwing implement and the tension created in the muscles. As the position changes, so does the tension in the stretched muscles. Such a complicated technical action as the discus throw is based on key movement positions that create the best possible conditions for a maximal performance. This occurs by joining all the key phases into the total throw. The total throw is successful if the athlete learns and develops a technique that eliminates, as far as possible, faults in the single elements of the movements and of the key positions.

Specific exercises in the establishment of the classic technique are particularly important in the first few years of learning. It is only after the classic technique has been established that the athlete can afford to make changes based on individual demands. Also particularly important is to perform the exercises in a correct sequence of the single phases and in a certain temporal order of speed and rhythm.

The rhythmical structure of the complete throw is usually maintained by advanced throwers, although variations in the duration of the single phases take place. This is the reason for using different weight implements with different intensities to maintain as closely as possible the rhythm of the competition throw.

Further, the discus thrower adjusts his technique to the improved strength level and this is responsible for changes in the technique. After all, the most efficient final performance depends largely on the strength level of the athlete's muscle, tendons and ligaments, developed by exercises in the key positions. This strength is known as the specific strength of a discus thrower and the most effective means to develop specific strength are the specific preparation exercises.

The learning and development of the starting single support and the final single support phases are the most difficult in the performance of specific exercises. The task to perform these phases correctly is demanding. The rotating and at the same time forward moving system of the thrower-implement must create optimal conditions in the starting single support phase for the body mass to move ahead of the implement and should provide again suitable conditions for the acceleration of the implement in the final single support phase. The latter must occur with a fast placement of the left leg without a readjustment of the body

mass. It is a task that requires specific coordination, strength, speed and muscular elasticity.

All these qualities can be developed by using specific introductory and specific preparatory exercises. In using these exercises it is important to keep in mind that the duration of the above described positions and phases will become contradictory as the strength level improves. As this can slow down progress, the total turning action should be executed in the proper rhythm at different speeds.

BASIC PREPARATION EXERCISES

- Exercise No. 1
 - Sideways rotation into a half-squat position (lowest angle in the knee joint — 100° to 90°) with the feet placed wide apart. The weight of the barbell on the shoulders is 20 to 50kg. The exercise is performed at a slow speed. Attention is placed to keep the muscles involved in the hip extension continually under tension. The rotational action starts when the centre of gravity of the body is in the centre of the two legs. It reaches the maximum when the weight is shifted on the support leg. The exercise is executed without stopping on the support leg.
- Exercise No. 2
 - Similar to exercise No. 1, but without a rotation. The athlete moves from one leg to the other, with the lowest knee joint angle in the 100° to 90° range, in a bounding action. The weight can be carried on the chest.
- Exercise No. 3
 - Pushing of a light barbell from the chest up or forward while on the move. A push is performed every stride when standing on one leg. An intensive performance is required. The hips are not allowed to remain back and must be extended as the weight is pushed upward or forward. Attention is paid on the leg work, not the arms with the weight.
- Exercise No. 4
 - Start sideways with the legs slightly bent and the feet nearly together. The movement takes place from the heels to the toes and from the toes to the heels. A 10 to 15m distance is covered this way forward and backward in a straight line. The movement is executed by stressing the hip rotation without any shoulder action. The exercise can be performed without or with a weight on the

shoulders (weight 5 to 10kg). The knee bend should remain unchanged throughout the exercise.

- Exercise No. 5
 - Standing on one slightly bent leg the athlete moves sideways by shifting from the heels to the toes and from the toes to the heels. All the details described for Exercise No. 4 are applicable.
- Exercise No. 6
 - The exercise is performed lying on the back of a gymnastic mat with the arms extended sideways and the hands holding on a support. The athlete rotates his legs and pelvis without moving the upper body. The legs should be kept together and no folding in the pelvis should take place.
- Exercise No. 7
 - The athlete stands on the left leg with his stretched right leg supported by a gymnastic horse and weights in each hand. The exercise is performed by jumping slightly forward on an elevated (10 to 20cm high) surface without changing the left leg position. There should be no bending of the hips and the angle of the pelvis should remain unchanged.
- Exercise No. 8
 - The starting position is the same as in Exercise No. 7, only the lead leg is placed on a lower elevation (40 to 60cm) and no jumping action takes place. The athlete simply performs a leg bend with a barbell on shoulders, keeping the back straight. The support leg should be placed an optimal distance from the elevated to create tension in the hamstring muscles of the elevated leg.
- Exercise No. 9
 - The athlete, standing with his feet shoulder width apart, executes forward arm swings (the action of the crawl stroke in swimming) with weights in each hand. The arm action is assisted by a half rotation of the hips. The same exercise can also be performed in the opposite direction.
- Exercise No. 10
 - Rotation of the hips and legs (simple up to 90°) up to 180° (complicated) with a bar or javelin held in sideways stretched arms on the shoulders. There should be virtually no changes in the

angles of the hip and knee joints. The shoulder girdle should remain motionless and the exercise is performed fast.

- Exercise No. 11

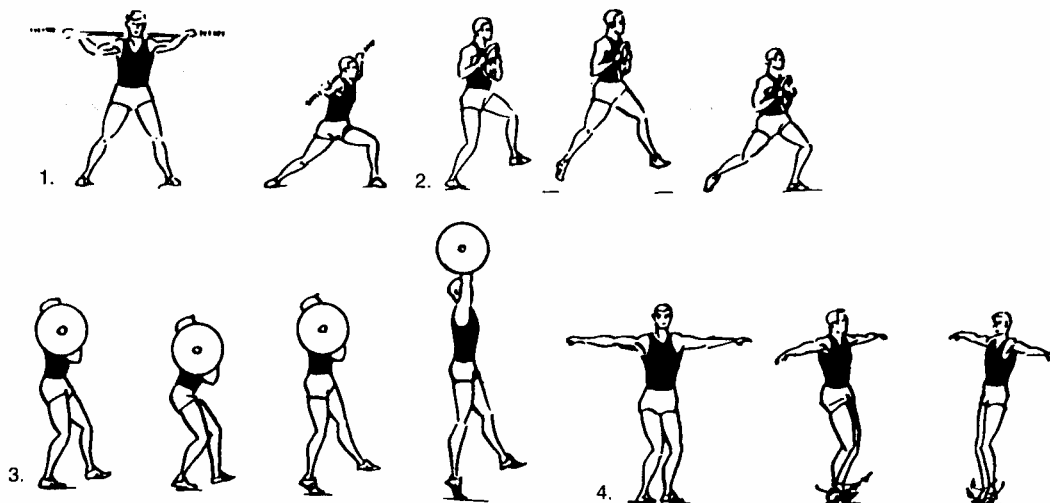
- A rotational forward movement similar to the discus turn. The exercise is started with an optimally bent left leg in front. The right foot is turned 45° to 90° inwards. The athlete carries on sideways extended arms and suitable load on the shoulders. The trunk is turned to correspond with the forward movement of the right leg, faced the same distance ahead as in the discus turn. The left shoulder is in the final position slightly lower than the right. The centre of gravity is shifted over the left leg and the right hip has to be at its highest point before the foot is placed.

- Exercise No. 12

- The exercise is started standing on an elevated surface with legs shoulder width apart and knees slightly bent. The athlete carries a weight on the shoulders or hips and attempts to execute a jumping 180° turn. The legs and hips initiate the turn. The knee and hip joint angles should remain similar to those in the actual discus throw. The exercise can be performed with a reduced load by executing 90° to 180° jump rotations in succession on one leg only.

- Exercise No. 13

- Running over hurdles using alternate lead leg action.



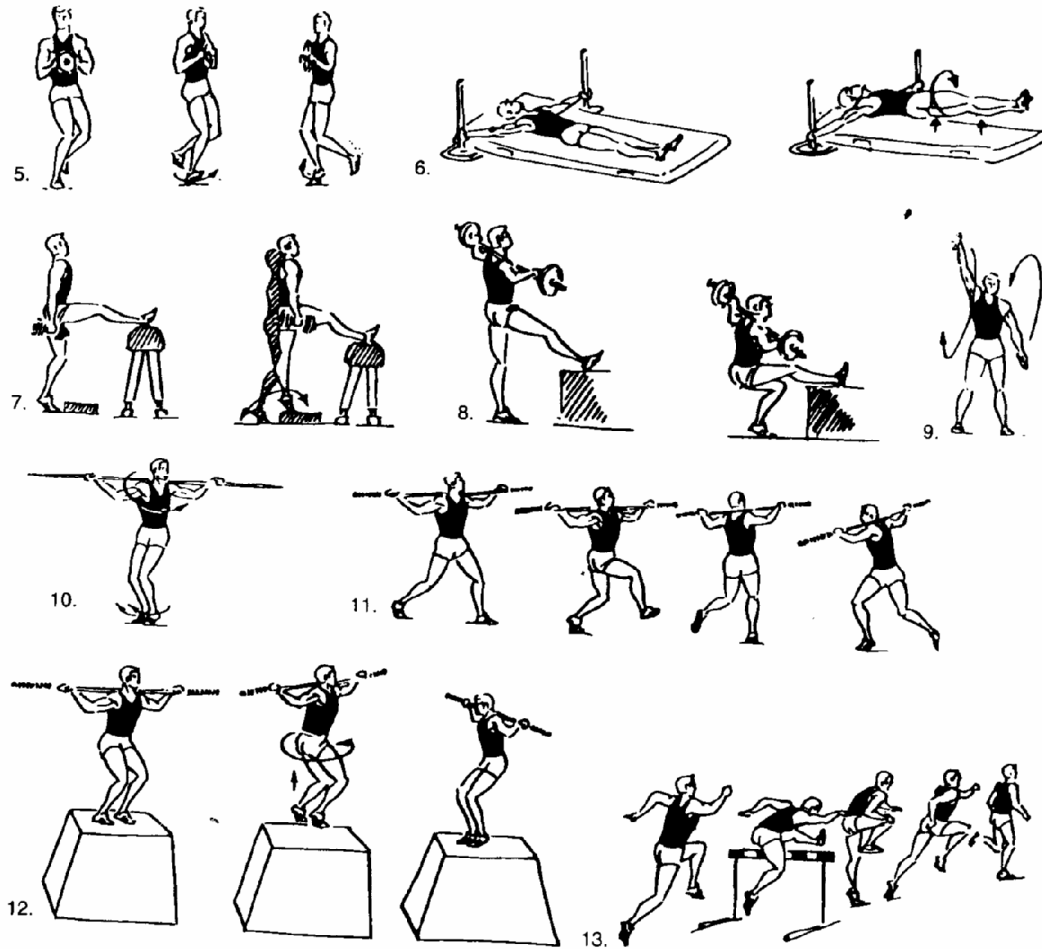


Fig. 1: Basic Preparation Exercises

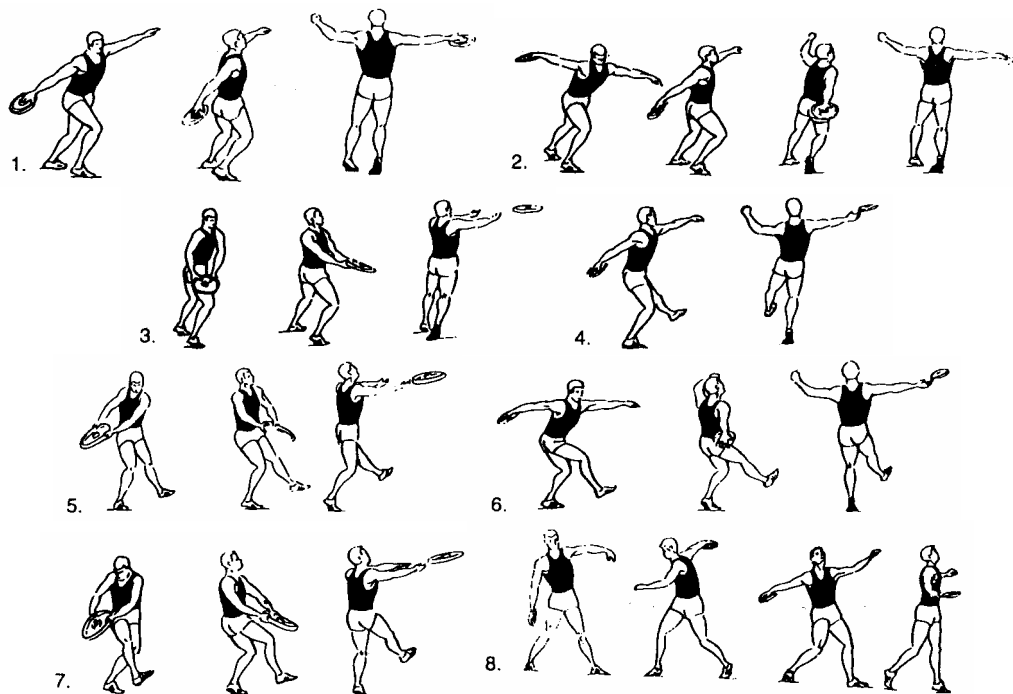
SPECIFIC PREPARATION EXERCISES

- Exercise No. 1
 - The imitation final delivery action with an implement that is 3 to 5 times heavier than the competition discus. The exercise is performed in a standing position with only the final half of the delivery.
- Exercise No. 2
 - Similar to Exercise No. 1, but with a full delivery action and an implement that is 2 to 4 times heavier than the discus.

- Exercise No. 3
 - The exercise is performed in the final delivery position holding a weight disc (5 to 15kg) with both hands. Avoid lifting the left shoulder higher than the right and stress the rotation over an “elastic” left leg support.
- Exercise No. 4
 - Standing on an optimally bent right leg with the left leg unsupported and the left side of the body facing the throwing direction. The throw is executed with the standard discus or other implements without allowing the left foot to drop on the ground.
- Exercise No. 5
 - Similar to Exercise No. 4, but the throw is executed holding a weight disc (5 to 10kg) in both hands.
- Exercise No. 6
 - Standing on an optimally bent left leg with the right leg unsupported and the shoulders turned slightly “inward”. The throw is executed with the standard discus or lighter implements without allowing the right leg to drop on the ground.
- Exercise No. 7
 - Similar to Exercise No. 6, but the throw is executed holding a weight disc (5 to 10kg) in both hands.
- Exercise No. 8
 - Standing throws with a limited rotation using a variety of implements (up to 10kg). Emphasis is placed on “catching” the implement with the right shoulder and keeping both feet on the ground.
- Exercise No. 9
 - Standing throws with a preliminary backward cross-step with standard weight and lighter implements. The right leg is lifted at the moment the discus hand starts moving to the right.
- Exercise No. 10
 - Throwing the discus or other implements with a discus turn that is started from a position facing the direction of the throw. Emphasis

should be on keeping the discus back and a fast placement of the right foot after the drive from the left leg.

- Exercise No. 11
 - Similar to Exercise No. 10, but the throw is executed holding a weight disc (5 to 10kg) in both hands.
- Exercise No. 12
 - Similar to Exercise No. 10, but taking a stride forward before the discus turn is executed.
- Exercise No. 13
 - Imitation of a half-turn on a gymnastics form with or without light implements. The action is executed without stopping, avoiding looking down.
- Exercise No. 14
 - Separate or continuous rotations (90°-180°-270°-360°) around the body's axis to the left, maintaining the basic starting position until the right foot is grounded. The initial hip and knee joint angles remain unchanged.



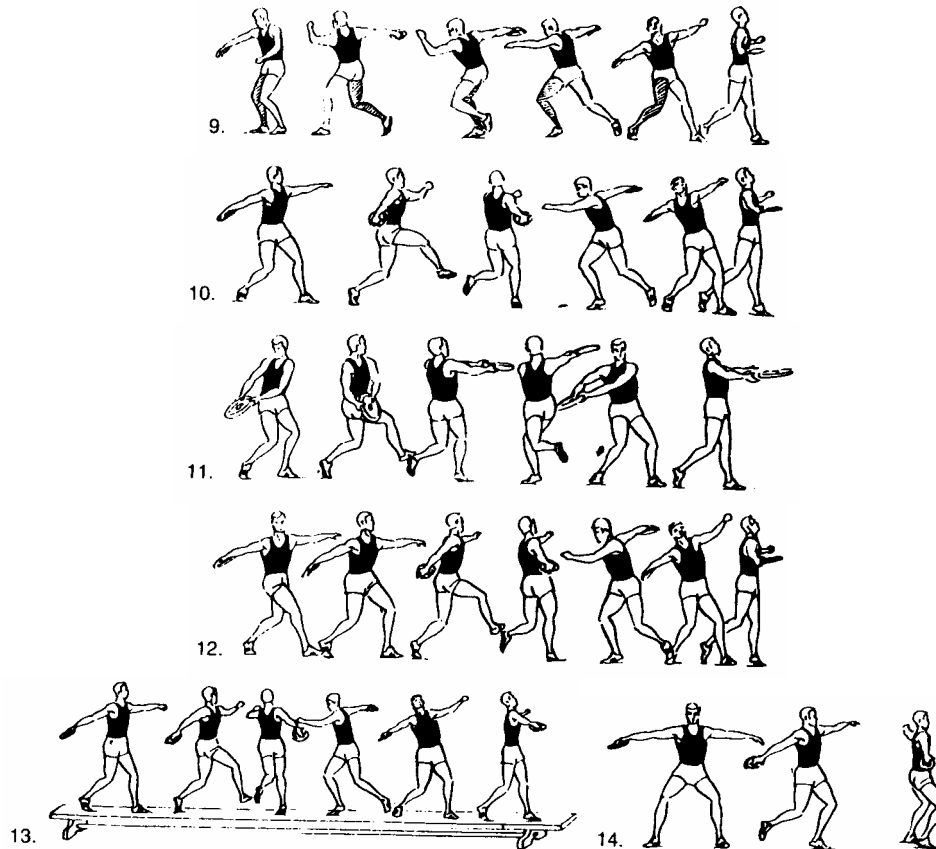


Fig. 2: Specific Preparation Exercises

SPECIFIC THROWING TRAINING

It is recommended to divide specific throwing training into three categories according to their effect on the development of technique:

1. Throwing of implements with the highest effect (only standard discus).
2. Throwing of implements with a high effect (men -1.5 to 2.3kg; women - 0.75 to 1.25kg).
3. Throwing of implements with a limited effect (considerably heavier or lighter than the standard implement).

It is advisable to use flat surface implements in training because round implements change the sequences of muscular work, as well as the application of form and movement speed.