

The preparation of junior athletes for the combined events

By Peter Jeřábek

The highest possible level of movement competency is a necessary precondition for developing technique. Of all the disciplines in athletics, the combined events place highest demands on the athlete's physical, psychological and technical abilities. Though the development of correct movement habits from the very beginning of training is of great importance to all sports and all athletic disciplines, it is probably most important for combined event athletes. In this article the author discusses movement training for pre-teen and teenage athletes with the view of laying a good neuro-muscular foundation for the later development of technique in running, jumping and throwing events. He provides guidance for properly focusing the activities of younger athletes and extensive lists of exercises and drills for teenagers. This article is adapted from a presentation given at the High Level Coaching Seminar 'Combined Events' (Prague, Czech Republic – 27-30 September 2002).

ABSTRACT

The author was born in the Czech Republic. He presently works at the "Czech Youth Sports Centre". He is a renowned coach of young athletes.

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Introduction

This paper addresses features of the initial training phases for young athletes in relation to preparation for the combined events. Its three sections contain:

- ◆ Background information on the characteristics of the combined events and the demands placed on the athlete.
- ◆ Information on the preparation of children, key movements of drills to develop basic athletic skills, and examples of exercises for the 8 to 12 year old age group.
- ◆ Information on developing movement competence in teenage athletes (14 to 18 years old) including a brief list of exercises, which may be used in the training of combined events athletics.

Event characteristics and performance structure of the combined events

The combined events include all groups of athletic events – running, jumping, throwing and shot putting – and, therefore, are the most all-round, all-encompassing and apparently the most difficult events. They place high demands on the development of the athlete's physical and psychological abilities. The form of these demands can be grouped as follows:

1. Level of bio-motor development

This is expressed in the following forms:

- ◆ Speed: reaction speed (start reaction), cyclic movements (running), non-cyclic movements (jumps, throws, shot-putting)
- ◆ Strength: the basic precondition to make any movement. A high level of explosive power abilities, which are the basis for cyclic and non-cyclic velocity, is desirable.
- ◆ Endurance: necessary for the ability to resist fatigue and give a maximum performance and the ability to withstand a workload for a relatively long period of time
- ◆ Agility and suppleness: these have a major impact on the level to which technique can be developed and thus may limit the athlete's technique in some events (e.g. hurdles, pole vault), which implies performance limits

2. Level of combined events technique

It is desirable that the athlete develops correct movement habits from the very beginning (although they may not necessarily involve the learning of individual event techniques) as this may help him/her absorb rational technique later on. It is always very difficult and time-consuming to retrain bad movement stereotypes.

3. Psychological quality

Psychological strength is a basic precondition for successful management of the high training load and demanding competition

situations faced by combined event athletes. A good level of perception and motor skills, to master all the required techniques, as well as intellectual and social abilities are also highly desirable.

4. Scoring system

Some of the disciplines within the combined events may be more suited than others to the abilities of a given athlete. The training strategy and content must take this into account.

A comprehensive and complex approach to combined events is the main principle on which the training must be built. Training for combined events cannot be just the sum of training means used in individual events. Concentrated training of one of the events may be a restricting factor for the other events (e.g. 1500m versus the sprint events). At the same time, the right load strategy may result in positive effects for several events (e.g. long jump - pole vault - hurdles). The training for the combined events will always involve compromise, between the development of apparently opposite movement skills and in how much time should be devoted to each of the individual disciplines. To complicate matters, these decisions must take into account the qualities, strengths and weaknesses of each individual athlete, so there is no universal scheme that can be applied.

Training activities for young children

General Principles

The development of correct movement habits from the very beginning of the training is of the greatest importance to all sports and all disciplines within athletics. This is why I consider the basic movement preparation of school children (between 8 and 12 years of age) to be essential.

The content of training must, of course, correspond to the mentality and health

aspects of the age category. Children must be engaged in all-round and manifold exercises using different kinds of games to develop coordination and movement frequency. The development of other bio-motor abilities (strength, endurance) should, by and large, be applied to later training phases. If the motion activity of children is canalised correctly in the very beginning of their athletic training, a good neuro-muscular base can be developed for later.

Forming athletic movement habits

From the perspective of application to athletics, the activities of children in this age group should focus on the following:

1. Take-off fastening

Fastening the take-off is important for correct running and jumping technique. Attention must be paid to full extension of all joints (toe – ankle – knee – hip) and the head's position as it works as a wheel of movements must be watched. If a child does not perform the exercises properly, he/she should be interrupted and given an explanation and demonstration so that he/she learns how to feel the take-off in the centre of gravity. Exercises with arms akimbo such as "stork stride, sparrows", various jumps, jumps over low and safe barriers, etc., are very helpful.

2. Leg and arm swing

This exercise is about coordination of the motions important for running technique and for good performance of all take-offs. Thorough explanation of the coordination of the swinging leg with opposite arm and multiple model demonstrations of correct performance are necessary during these drills.

3. Foot placement

This applies to the position of the feet with regard to the running axis and to putting full weight on the ball of the foot and toes.

4. Combining run-up with a take-off

This is a key element in all jumping techniques. Attention must be paid to correct performance from the very beginning, especially to fluency and movement acceleration. It would be suitable to start with running over low and safe barriers, as well as with "high and long" jumps. Knee and arm swings should be added gradually.

5. Throwing

- ◆ Throwing large, light balls (volleyballs, basketballs) may develop the habit of gradual involvement of muscular groups (legs – trunk – arms). This is important for all throwing events. Almost all exercises involving throwing full balls can be used because everything depends on the structure of the motion and using light balls will not overload the motor system.
- ◆ Throwing small balls (tennis balls) provides the basis for javelin throwing technique. Attention should be paid to the position of feet to ensure stability in the throw. Careful attention should also be given to the position of the arm and hand (maximum back extension and palm turned up).

These selected exercises support the correct development of interplay of the neuro-muscular system in children. This interplay is necessary for the technique training that comes later in the athlete's development.

Training activities for teenage athletes

Development of agility

Training for athletes between 14 and 18 years should put emphasis on the development of bio-motor abilities (speed, strength and endurance) but it is still important to continuously develop general coordination abilities and reinforce athletic skills, e.g. event related techniques. The highest possible level of movement competency is a necessary precondition to develop technique and agility has a substantial impact on how fast any new motion will be learnt.

Development of new technical elements must be regular and fluent, because long breaks significantly reduce motor learning ability. To develop agility, any exercise with new elements may be used. Such exercises need not be improved to a perfect execution; it is simply enough to try to perform them and their value is reduced as soon as they are managed automatically, without conscious concentration. The following exercises requiring a higher level of coordination may be used:

- ◆ Changes in the motion – starts from various positions, backward long jump, etc.
- ◆ Mirror movement – jumps from the other foot, throwing with the other hand, etc.
- ◆ Changes in the space dimensions, speed or pace of the movement – hurdle running over shorter distances, discus throwing and shot putting from a smaller circle, etc.
- ◆ Changes in technique (performing disciplines with non-competition techniques) - spinning shot put, straddle high jump
- ◆ Making the exercise more difficult with supplementary movements



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In addition to athletic means, gymnastic exercises are the best tools for developing agility. They contribute to the development of the sense of motion, motional precision and weightlifting abilities. They also help to make the training more varied. Every combined events athlete should have a wide variety of gymnastic exercises:

Floor exercises:

- ◆ Forward/backward/backward swing rolls
- ◆ Handstand
- ◆ Forward/backward/side tumbles
- ◆ Forward/backward somersault from the floor and from a small trampoline, eventually with a twist

Horizontal bar:

- ◆ Circle
- ◆ Kip to support
- ◆ Forward/backward/astride circles
- ◆ Backward circle
- ◆ Lift-up in swing
- ◆ Eventually, grand circles

Rings:

- ◆ Lift-up in a pull with both arms
- ◆ Kip to support
- ◆ Circle
- ◆ Forward/backward slip
- ◆ Straddle backward roll

Parallel bars:

- ◆ Moving along the bars hand over hand
- ◆ Swinging
- ◆ Arm stand
- ◆ Roll
- ◆ Kip to support
- ◆ Straddle vault at the end of the bars

If the motion's structure is managed, many gymnastic exercises are also a convenient tool for the development of weightlifting abilities.

Development of selected bio-motor abilities and skills

Weightlifting abilities may be developed in several other ways. First, the weight of the

athlete's body may be used as resistance. When the important muscular groups (especially muscles straightening the spine) get stronger, weights (dumbbells) can be used. Maximum attention should be paid to the development of explosive weightlifting abilities. Examples of weightlifting development exercises include the following:

Without weights:

- ◆ Press-ups
- ◆ Pull-ups
- ◆ Raised-leg
- ◆ Sit-ups
- ◆ Metronomes
- ◆ Ordinary sit-ups
- ◆ Climbing
- ◆ Handstand press-ups
- ◆ Moving along the bars hand over hand and bar gymnastics,
- ◆ Lift-ups on rings, on the horizontal bar, etc.

Note: The exercises are to be performed dynamically with 5-20 reps in each set and 3-5 sets in a session.

Throws:

- ◆ Various throws of medicine balls
- ◆ Light solid dumbbells
- ◆ Shot putting
- ◆ Overhead throws of balls
- ◆ Forward throws, projecting from chest
- ◆ Side throws with one hand and both hands

Note: These can be done individually and in sets.)

Take-offs and jumps:

- ◆ Jumping trot
- ◆ Ankle push-off and push-down
- ◆ Running push-off
- ◆ Multiple standing jumps on one leg

Note: These can be individually and in sets.

With weights:

- ◆ Weight, solid dumbbells
- ◆ fitness vests

- ◆ Sandbags
- ◆ Bench press
- ◆ Leg press
- ◆ Pulls
- ◆ Squats
- ◆ Front squats
- ◆ Toe stands
- ◆ Trunk curl

Complex dynamic weight training:

- ◆ Various combinations of exercises from previous groups on stands
- ◆ Circuit training
- ◆ Eventually an obstacle course

Mobility exercises must be incorporated in all phases of the year-round training programme. They help joint motion and stretching of relevant muscular groups. This is important both for the performance itself and for avoiding various muscular injuries. Stretching should always follow a thorough and proper warm-up, both in the static and slow tension form, or with another gymnast or with weights. Stretching may also be used as a workout:

- ◆ Gradual trunk bend (hold the extreme position)
- ◆ Kneeling position – sitting position on heels, lying on the back (hold for at least five seconds)
- ◆ Sitting position - pull up legs, join the feet, take up insteps, pulling the head to toes
- ◆ Side and front splits
- ◆ Lying on the back, legs pulled over the head (pull-overs)
- ◆ Holding a pole with both hands in front of the body and move it in a bow behind the body (stretched arms, narrow the hold gradually)
- ◆ Hurdle ABC

Imitation exercises based on individual event techniques can help learning or create the right movement rhythm before training or competition. The following are

also tools for the development of motor abilities:

- ◆ Running ABC in variations
- ◆ Long jump take-offs with continuous strides,
- ◆ Exchange of hang position on the rings
- ◆ Rock back in the rings, on the horizontal bar, wall rack, or a swing rope
- ◆ Backward roll with a swing over a hurdle
- ◆ Hurdle ABC, exercises in a hurdle sitting position
- ◆ Side and middle running over hurdles with 1-3 strides between hurdles
- ◆ High jump with feet together at take-off, crossing a bar from a boxed vaulting horse,
- ◆ Repeated shot put pushes or discus turns on a line
- ◆ Jumps and throws from a stand or shortened run-up
- ◆ Crossed jump over a tape
- ◆ Throws at a target

Compensation and balance exercises

Compensation and balance exercises should be incorporated in all phases of the year. They help prevent various mobility defects, overload pain and muscular imbalance. The exercises should be selected according to the type of training load.

Take-off training should be followed by relaxation of the ankle joint, exercises of the foot and Achilles tendon stretches. Examples include:

In the standing position:

- ◆ Alternating a toe stand and heel stand,
- ◆ "Inchworm" (moving forward by gripping and pulling with the toes),
- ◆ Standing on one foot with the other leg curling in and out
- ◆ Pick up various objects with the toes. Roll a pole or small ball on the floor
- ◆ Standing press (alternating a toe stand and putting weight on the whole of the feet)

In sitting support:

- ◆ Toe bending and stretching
- ◆ Toe extension and contraction
- ◆ Ankle joint movements (extension, flexion, rotation to maximum extent)
- ◆ Pick up various objects with the toes
- ◆ Roll a pole or small ball on the floor

In the running training programme, exercises should ensure that all the main leg joints are relaxed, the back parts of thighs are stretched and the lumbar spine is relaxed. Examples include:

Lying on the back:

- ◆ Raise arms, pull over the toes, push the lumbar spine on the mat – hold

In a sitting position:

- ◆ Raise arms, pull the toes back, gradual trunk bend to the maximum position – hold – relax, breathe in – breathe out, extend the bend (three reps)

From a standing position with feet together:

- ◆ A single bend (with heels on the floor), move hand over hand forward, backward and to side

From a standing position:

- ◆ Raise arms, bend deep– pull the toes alternately toward the shinbone

From a sitting flex position:

- ◆ Bend trunk, grab up toes and alternately stretch and bend the knees (left, right, both)

The relevant muscular groups should be stretched during the weight training (immediately after the load). Bias towards one hand or side should be compensated during technique training by making take-offs, throws and shot-puts with the other hand or leg.

Rehabilitation and relaxing exercises for spinal dynamics should be regularly included. They should be performed slowly and fluently, usually with 5 –10 reps. Examples include:

Lying on the back:

- ◆ Raise arms, stretching – hold 8 -10 seconds - relax
- ◆ Bend knees keeping the feet on the mat, stretch one leg and slightly oscillate above and below the level of the other leg's bent knee
- ◆ Bend both knees, raise arms and the pelvis at the same time – breathe in, arms down, push the pelvis against the mat and pull the knees to the chest – breathe out
- ◆ Bend both knees, cross arms on the chest – breathe in, sit up fluently and breathe (moving the trunk slowly up) and then back to the lying position

Lying on the side:

- ◆ Stretch legs out with toes up, stretch legs up and backward, back to the position with legs stretched out
- ◆ Pull a knee to the chest, foot and knee in line and stretch the leg out

Lying on the chest:

- ◆ Fold hands under the forehead with palms down, lift the head and arms, bend the trunk back
- ◆ Bend a knee and pull the leg over to the armpit
- ◆ Raise the left arm and stretch out the right leg, and vice versa
- ◆ "Breaststroke" (only with arms) with the trunk bent slightly back

Press-up position on the knees:

- ◆ Alternately stretch the left and the right leg
- ◆ Turn the trunk to the left, stretch the left arm sideways and up – the head follows the trunk movement – and vice versa
- ◆ Sitting position on heels, raise arms to the right and to the left
- ◆ Upright kneeling position, raise arms, breathe in, relaxed trunk bend to knees, breathe out

Crossed sitting position:

- ◆ Stretch arms sideways, forearms vertically to the floor (candlestick), gradually raise arms and back to the candlestick
- ◆ Candlestick, trunk rotation – pay attention to the precise holding of arms.