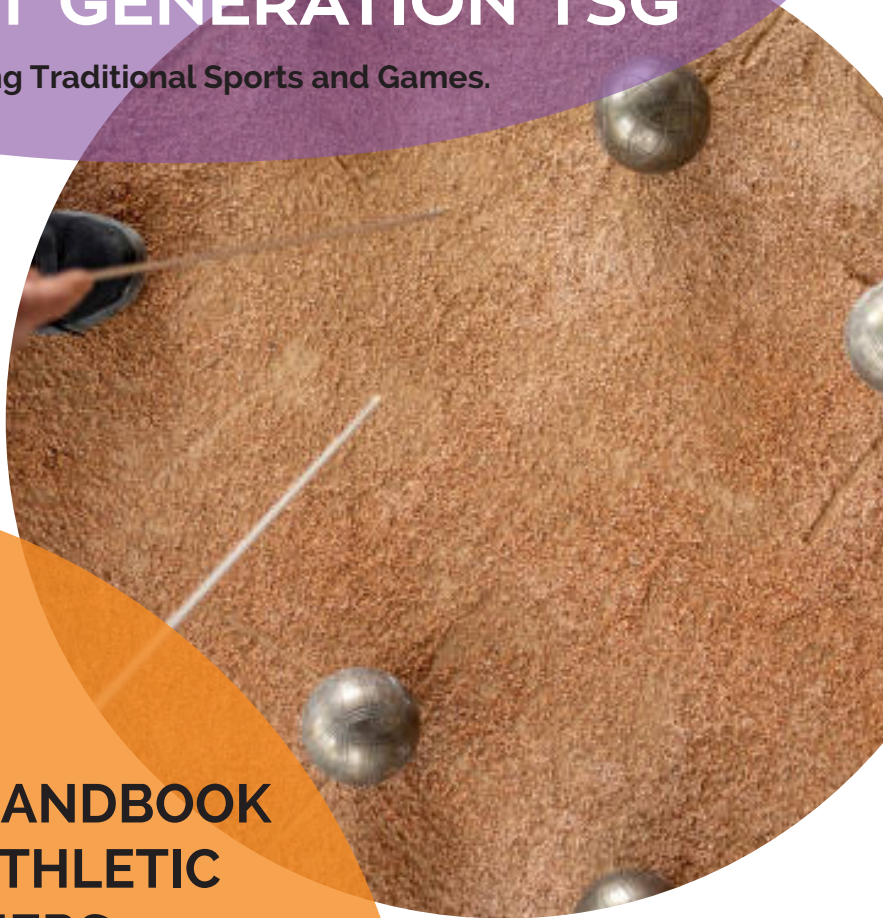


# BOCCIA, PLJOČKA AND BULIN

## NEXT GENERATION TSG

Revitalizing Traditional Sports and Games.



## TSG HANDBOOK FOR ATHLETIC TRAINERS

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# 1. INTRODUCTION

Conceptually, tradition refers the transference of knowledge, realizations, beliefs, legends, customs and cultural values handed down from generation to generation, from one era to another, either by oral or written transmission, as well as education (Matasović and Jojić, 2002, page 1341).

*Pljočkanje* (a village game best described as puck tossing) and *Boćanje* (often referred to as bocce ball), the old traditional games of the Croatian coast are most popular on the Istrian peninsula, near Rijeka as well as in Dalmatia and the Dalmatian hinterlands (locally referred to as Dalmatian Zagora). For both of these games, the goal is to bring the main prop, i.e., the ball, into such a position that it is closer than that of the opposing team.

## 2. ORIGINS OF PLJOČKANJE

*Pljočkanje* is an old folk game, originally a shepherd's game, in which shepherds, usually children, used to pass the time while tending their livestock. It's named after the basic prop for the game, the *pljočka*, originally a flat, palm-sized stone carved from thick slate. In addition to the *pljočka*, a smaller round-shaped stone in the size of a fist is also needed as a jack. It is called the *bulin*, *balin* or *pljočkaš*, depending on the region where *pljočkanje* was being played. We shall refer to these props as the *pljočka* and the *bulin*.

Slate tiles were most often found at the game site, and the *pljočka* was shaped so that one was chiseled against the other until the desired shape was obtained. It could also be carved with a hammer, but it was important that all the pucks were identical in size. The game took place in nature, on an unmarked grassy field from early spring to late autumn, i.e. during the grazing period. The game of *pljočkanje*, *pločkanje* or *prahćanje* – taken from the word "ploča" or tile, precedes another ancient game called *boćanje*, or *balota* (nowadays referred to as bocce ball) which, over time with its similar game rules, replaced the original ancient fun-loving competition of shepherds and "ordinary people" throughout Dalmatia and Istria.

By learning about these nearly-forgotten games of our ancestors, we can save them from oblivion.



Exhibit 1.  
The *Pljočka*



The game of *pljočkanje* ("flat stone throwing game", "puck tossing") requires at least two players and can be played one-on-one (whereby each player has three pieces), in doubles (so that each player has two pieces), or in threes or fours, whereby each player has only one piece. The game begins by deciding who throws first and thereby the game starts by agreement or with an even-odd method.

First, a ball was thrown onto the field, then the distance from which the shot was set was determined, and then the first *pljočka* was tossed. The objective of the game is to toss the *pljočka* as close as possible to the *bulin* and win a point, *punat*. The individual or team that first achieved 11 or 13 points was considered the winner of the match, *partida*. Apart from the fact that it was important to throw the *pljočka* as close to the *bulin* as possible, one tried to knock the opponent's puck as far away as possible.

In order to determine who won the point, the distance between the *pljočka* and the *bulin* (marker ball) was measured using the method of placing one foot in front of the other or by measuring with a wooden stick. Competitors performed the measurements independently, and since there were no referees, trust, honesty and fair play between the players was extremely important.

Exhibit 2. *Pljočkanje*

# 3. ORIGINS OF BOCCE

Regarding the origins of bocce, it is difficult to provide any conclusive knowledge. During excavations of the Turkish city of Çatalhöyük, which was in existence 7000 years before our era, the English archaeologist James Meleart found round objects that he imagined could represent game props. Egyptian excavations have also proven the existence of the game 2500 years before Christ.

While excavating the city of Luxor, walls of family homes displayed frescoes gracing the theme of lawn bowling. Evidence of the game was also found in ancient Greece.

Hippocrates himself, the famous physician, advises playing bocce to alleviate health problems. The ancient Romans also played bocce, which is evidenced by the fact that among the excavations of the city of Pompeii in 79 BC., one boccia and a smaller marker ball were uncovered. In the Middle Ages, the game of *boćanje*, which is also known as *balote*, was well-established and very popular along the coastal region of Croatia.

The first written law regulating the game was created in England by King Charles II (1630 – 1685). In 1872, Thomas Taylor invented a special machine for making "Lawn bowls" (EN). In 1873, the first Italian club was founded in Turin, followed by other clubs throughout the country until the first official competition was held in 1900. In 1888 in France clubs joined a regional league and held their first official competition in 1890.

In the photo below from 1894, Dr. Franjo Bučar, the father of Croatian Olympism, demonstrates the principles of bocce ball at a gymnastics teachers' course held in Zagreb, Croatia.



Exhibit 3. Gymnastics teachers' course in 1894 led by Dr. Franjo Bučar, the father of Croatian Olympism

The first metal balls were made in 1923 in France in the area of Lyon (hence, these balls, or French boules, were called Lyonnaises). Before that, boules were carved from stone, followed by large wooden boules and boules with nails which were used until 1902. Since then, the game of bocce has undergone many changes. In the beginning, it was played with round stone balls, followed by balls made of baked clay or wood, which are still in use today in some parts of Dalmatian Zagora.

With the development of technology, it is often played with synthetic (Raffa, Lawn balls) and metal (Volo, Pétanque) balls. The difference in the material from which they are made denotes the rules and ways of playing. The Lawn bowls association uses oval-shaped balls with a diameter of 130 mm, with one side heavier than the other, while the Raffa association uses balls with a diameter of 109 mm; the Pétanque association uses boules with a diameter of 78 mm, while the balls used in competitions of the International Bowling Federation (FR., Fédération Internationale de Boules) are made from an alloy of brass, aluminum, iron, nickel and magnesium with a minimum hardness of 20 to 25 Rockwell and filled with elastic bands.

## 4. AN ANALYSIS OF PLJOČKANJE

The traditional, nearly extinct folk game of aiming to toss a flat stone called a *pljočka*, from which it got its name, has been known since ancient times. In this game of precision, the basic goal is to advance the *pljočka* towards a marker ball (*bulin*, meaning small ball, could also be a rock) from a distance of five meters or, better yet, to knock the opponent's *pljočka* as far as possible from

The first metal boules were made in 1923 in Lyon from an alloy of bronze and aluminum. Innovators Vincent Mille and Paul Courtieu gave them the name "Integral". In 1954 and 1955, Italian factories began producing fab, martel, and caudera boules, and at an important turning point from 1955 to 1956, Italy passed a rule setting a new standard of playing with metal boules instead of the previous ones made from paste, a type of bakelite.

From 1985 onward, the balls were empty (hollow) and bounced when released but were very stable and precise when rolling. The year 1984 was recorded as a revolutionary year in its history, because, at the World Championship in Australia, Italian representative Pasqualino Bruzzone competed with balls whose interior was filled with elastic bands. Such balls did not jump when being released (more on that later), and while rolling, they had the property of empty balls. What followed was a turn in game tactics, game philosophy, and of course, the industry of ball production. After 1982, all factories began researching the production of boules filled with rubber bands or filled with a mixture of rubber bands and lead so that they would not bounce when expelled from the player's palm. The aim was to bring the properties of such balls closer to the properties of hollow balls while rolling, a task in which they largely succeeded.

the marker ball and thus win a point. It was most often played to 11 or 13 points, exceptionally to 15 or 21 points. The grass field on which the competitions are held is 20 meters long and 4 meters wide. Considering that children also like to play this game of *pljočkanje*, the dimensions of the playground and certain distances are proportionally reduced depending on the age of the participants.

*Pljočkanje*, according to the sports criterion of structural complexity, is considered a monostructural sport of a cyclical character, and when it comes to the sports definition of dominance in sports ability, it is classified as a sport of precision.

## Biomechanical analysis of elements of its technique

**Throwing (aka expulsion, ejection or breaking out)**, is the basic element of the game of *pljočkanje*. In a slightly diagonally

striding stance where the weight of the body is evenly distributed, the distance between the feet is equal to the width of the shoulders, the toes are pointed forward, the knees follow the projection of the toes and the trunk is in a slight forward bend, the dominant hand executes the throwing of the *pljočka* according to the right hand - left foot principle. Just before the throw, the weight is transferred to the landing leg in order to achieve greater forward momentum and follow through in harmony with the body's movement. It is ideal that the *pljočka*, when thrown from the hand does not spin in the air, like a frisbee, but that it flies straight and falls motionless on the playground, usually the lawn.



Exhibit 4. Throwing in the game of *pljočkanje*

## 5. AN ANALYSIS OF BOCCE

Bocce (Italian boccia: round ball, *boča*) is a sports game in which, by rolling or throwing the boccia on a flat track, you try to get the boccia as close as possible to the jack or marker ball, or push the opponent's boccia as far as possible away with your boccia. It is important, therefore, to point towards the marker ball (Croatian "*bulin*") as closely as possible or, to better yet, remove (hit) the opponent's *boccia* that interferes with our team's advancement. Bocce ball can be played on the ground, that is, while pointing towards the *bulin*, or, it can be launched into the air in order to hit the opponent's boccia and eliminate it from further competition. The game starts with the team that won by drawing lots which throws the *bulin* behind the base line in the rectangle at the other end of the field.

Bocce consists of: - individual classic; - pointing and breaking out in a circle; - couples; - triplets; - precisely breaking out; - speed breakout; - speed breaking out in pairs (relay break).

According to the criterion of structural complexity, bocce is considered a monostructural sport of an acyclic character. As defined in accordance with the criterion of sporting capacity and dominance, *boćanje* falls within the sports branch of precision. Endurance, coordination and agility, along with precision, are crucial for performing optimal movements.

## Biomechanical analysis of the technical elements in bocce

**Pointing (aka Lagging, Eruption) and elimination** are the basic elements of the game of bocce. Depending on the terrain, the pointing part of the game is performed in a low, semi-high and high stance. Elimination, on the other hand, can be further classified into premature, timely and delayed eruption. Unlike the pointing, eliminations are not variable. As a rule, every bocce player adopts and uses the method that suits him best. The delayed thrust is used the most, which is also the most natural and closest to walking and running.

### POINTING

Pointing (or lagging) means throwing the bocce ball in the direction of the jack (*bulin*) in an effort to get closer. The point and methods of pointing depend upon the terrain, so there are three types of point, which is why the necessary movements (swing and exit) are performed while throwing the bocce. Pointing is basically the totality of movement and stances while performing different ways of throwing the ball and is divided into: - low stance; - semi-high stance; - high attitude.



Exhibit 5. The boccia or *boća* (silver) and the jack or *bulin* (green)

In order to achieve optimal performance for pointing, it is important to perfect:

1. Holding the bocce ball
2. Body positioning and stance
3. Control of the direction
4. Control of the distance
5. Analysis of movement (with or without the bocce ball)



Exhibit 6. Holding the bocce ball

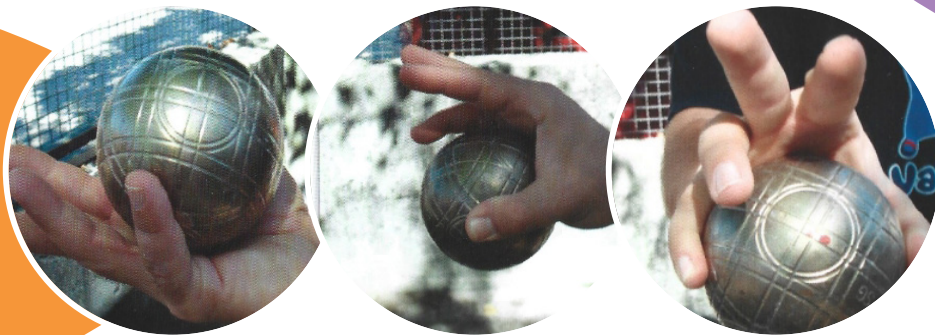


Exhibit 7. Correct holding of the *bocča*

The position of the body and the way the *bocča* is held in the hand depends on the type of terrain. It is held between the little finger and the thumb, and cradled with the other fingers so that it does not fall out. We must then, most correctly, direct it towards the goal. An important detail of the pointing technique is ensuring that the hand holding the ball and the landing leg are on the same side of the body (right hand - right leg, left hand - left leg).

### 1. Low stance pointing

A low attitude pointing point is used for smooth and hard surfaces where sand granulation is mostly 0 mm. On such fields, the bocce ball should be lowered as much as possible to the plumpest part of the fingers so that the *bocča*'s position in the hand resembles a bell. The distance of the *bocča* that we throw from the body is between 0.15 and 0.50 meters from the throwing line. In this case, the ball does not bounce, i.e. it does not dig into the terrain, and its path is longer than with other throws. Although this point requires great effort due to the unnatural position of the head in relation to the body and shoulders, it is recommended for perfecting one's control of throwing, direction and distance. Before engaging in this type of training, it is necessary to conduct flexibility and balance training (range of motion in one or more joints and maintaining a balanced body position when performing different movements and positions).

### Low attitude pointing performance technique

- i. Hold the bocce ball with your fingertips, relaxed grip
- ii. Lean the body forward, with a 70:30 distribution of the landing leg weight to the balancing leg
- iii. Keep the back parallel to the ground
- iv. The hand holding the bocce is relaxed, 15 cm from the surface, while the other hand, at the time of preparation, is parallel to the hand holding the bocce
- v. Shoulders parallel to the ground, without deflection
- vi. The leg that maintains balance rests on the ground with the tip of the toes, and at the moment of expulsion, it rises and moves forward
- vii. The head gazes in the direction in which the bocce is pointing

The execution of the low point can be carried out with the help of a 15 cm high hurdle at a distance of 80 cm from the baseline. The athlete should throw the ball under the groin in a controlled manner and:

1. perform a specific movement structure without any object in the hand
2. perform a specific movement structure with a tennis ball in hand using an aimless throw
3. perform a specific movement structure with a tennis ball in hand while throwing it towards the goal
4. perform a specific movement structure with the bocce in the hand with an aimless throw
5. perform a moving structure with the bocce in the hand while throwing it towards the goal



## 2. Semi-high stance pointing

The semi-high position is used for medium-coarse substrates with sand granulation between 0 and 4 mm. Given the low stance, this method of pointing is much more natural and does not require great physical effort. The body is more upright, the head remains in almost a natural position, the forward bend is milder and the ball is thrown from the line of play from 1.5 to 3 meters. This training is recommended for perfecting one's control of throwing, direction and distance.

### Semi-high stance pointing performance technique

- i. With a firm grip, the ball sits between the little finger and the thumb, while the other three fingers cradle it, so control of the throw is noticeably greater
- ii. The body is still leaning forward but more upright than in the low stance, where the load on the landing leg is 60:40 in relation to the one that maintains balance
- iii. The back is bent forward, with the base closing an angle of 65 degrees
- iv. The hand carrying the ball is relaxed downwards, the hand is at the height of the knee joint, the other hand, at the moment of preparation is parallel to the hand carrying the ball

## 3. High stance pointing

The high stance is used for extremely rough substrates with a sand granulation of 4 mm. We throw the bocce ball more than 3 meters from the throw line and the body position is high and upright.

### High attitude pointing performance technique

- i. With a firm grip, the ball sits between the little finger and the thumb, while the other three fingers cradle it, so control of the throw is noticeably greater
- ii. The body is upright, with a 50:50 weight distribution on the landing leg and the balancing leg

- v. Shoulders are parallel to the ground
- vi. The leg that maintains balance rests on the ground with half of the foot, and at the moment of release, it rises and moves forward
- i. The head gazes in the direction in which the boccia is pointing

The semi-high point can be performed with the help of a 30 cm high hurdle at a distance of at least 150 cm from the baseline. The athlete should throw the ball over the hurdle in a controlled manner and:

1. perform a specific movement structure without any object in the hand
2. perform a specific movement structure with a tennis ball in hand using an aimless throw
3. perform a specific movement structure with a tennis ball in hand while throwing it towards the goal
4. perform a specific movement structure with the boccia in the hand with an aimless throw
5. perform a moving structure with the boccia in the hand while throwing it towards the goal

- iii. The back is bent forward, with the base closing an angle of 85 degrees
- iv. The hand holding the bocce ball is relaxed downwards, the hand is at hip level, while the other hand, at the moment of release is parallel to the hand carrying the ball
- v. Shoulders are parallel to the ground
- vii. The leg that maintains balance with its full foot rests on the ground and at the moment of release, it rises and moves forward
- viii. The head gazes in the direction in which the bocca is pointing

With all three types of pointing, pay attention to the position of the body, the position of the shoulders which should be parallel to the ground, and the position of the head. The view above shows 45 degrees in relation to the position of the head; the swing of the arm is at shoulder height; the distance between the landing and balance legs is 0.50 m

**N.B. When pointing and breaking out, the head position is the most important since it dictates all subsequent movements. After expulsion, it is very important to visually follow the bocce ball**

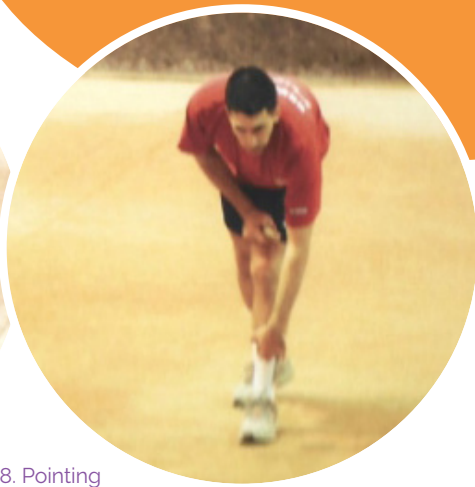


Exhibit 8. Pointing

Expulsion (aka "breaking out") means targeting a certain object (target) after a compilation of pointing movements. Breaking out is not an element of strength, but of flexibility and coordination, synchronization of the upper limbs with the lower ones using a natural stride and an optimal dose of strength, endurance and an economy of movement. When training to break out, one should pay attention to the correct holding of the boccia, noting whether the arm is relaxed next to the body, conducting the break out without rushing (for a proper throw out, every stroke should be gracefully followed through). Aids that are used for learning and perfecting the break-out include the auto-tire, using white balls at the finish line while the red ones serve as obstacles or hurdles. This technique succeeds in training the parabola so that the softness of the expulsion is achieved.

Training begins with expulsion without running (distance from the goal 4 m), then points with two steps (distance from the goal 5 - 6 m), four steps (when distance from the goal is 7 - 8 m) and six steps (distance from the goal corresponds to the entire playground area). It will be necessary to:

1. perform a specific movement structure without any object in the hand
2. perform a specific movement structure with a tennis ball in the hand with an aimless throw
3. perform a specific movement structure with a tennis ball in hand while throwing it towards a goal
4. perform a specific movement structure with the boccia in the hand with an aimless throw
5. perform a moving structure with the boccia in the hand while throwing it towards the goal

Furthermore, there are three types of expulsions both when pointing and when breaking out: They are classified as: a. premature; b. timely; and c. overdue.

**Premature** eruption is described as expulsion which, when expelling the ball, the landing leg is placed on the ground with the full foot and the opposite leg lags behind. The shoulder of the throwing arm drops and the body rotates towards the free arm.

**A well-timed toss** is a way of expelling outwards in which, at the moment of ejecting the bocce ball, the landing leg is full footedly placed on the ground and the opposite leg is parallel to the landing. The body is elevated, the head is upright and the opposite hand swings downward at the hip level.

**Delayed release** is described as, upon releasing the ball, the landing leg rests with its toes spread apart and the opposite leg steps forward. The fist opens and the boccia is thrown out. The body is bent in a slightly forward position, shoulders are parallel to the ground, the head is raised and the gaze is directed towards the goal. It is very important to continue to visually follow the ball after its expulsion from the hand. Speed, body, hand and hand speed, body position at the moment of maximal momentum, throwing and visually following the ball are necessary in order to achieve optimal performance during expulsion.

**In the preparation phase**, the hand follows through with "loading", pulled in front of the body through a full range of motion in the shoulder joint to the highest point, depending on the mobility of the joint. The player's shoulder rotation helps to promote such a throw, creating momentum and assisting those lacking good shoulder girdle mobility.



Exhibit 9.  
Preparing to expel the bocča



Exhibit 10. Preparing to expel the *boća*

### **BREAKING OUT with TWO STEPS performance techniques**

- i. Arm is relaxed next to the body, holding the boccia (the boccia is in the hand, i.e. under the arm)
- ii. Advance with the foot opposite the hand holding the boccia
- iii. Extend the body forward, so that the arm that is stretched down the body moves back swinging to the highest point of the swing
- iv. The balancing arm is also in swing, maintaining trunk balance and shoulder position
- v. The swing arm descends forward
- vi. At the same time, the leg follows the hand and takes another step forward
- vii. After expulsion, the head should remain directed towards the goal without moving around

In the phase of expelling the bocce ball, the hand moves forward with a full range of motion to the height of the field of vision. This movement is joined by an outward and forward rotation of the shoulder blades. At the moment of release, the hand is horizontal with the ground at a 55° angle.

### **BREAKING OUT with FOUR STEPS performance techniques**

- i. Arm bent next to the body (the upper arm and the forearm form an angle of 90°), the boccia stands in the hand, i.e. above the hand
- ii. Lunge forward with the leg opposite the hand holding the boccia
- iii. Extend the body forwards, the arm that is bent next to the body begins to extend forward, while the hand rotates and the boccia comes into position under the arm
- iv. The second step follows, in which the body is in a bent position, the arm is extended and the hand is fully rotated, which begins its preparation for the swing
- v. With the third step, the body extends forward, the hand that was positioned just a little in front of the body begins to move along the body downwards, then high, into a swing, up to the final point
- vi. The arm that balances the trunk also makes the swing
- vii. The arm descends forward from a high up swing
- viii. The leg follows the hand and takes a fourth step forward
- ix. This is followed by throwing the ball and following it with a straight movement, whereby the head should remain directed towards the target without sudden jerks in various directions

## **BREAKING OUT with SIX STEPS performance techniques**

- i. Arm is bent next to the body (the upper arm and the forearm form an angle of  $90^\circ$ ), the bocchia stands in the hand, i.e. above the hand
- ii. Lunge forward with the leg opposite the hand holding the bocchia
- iii. Body extension forward, so that the arm that is bent next to the body as it extends forward, shoulders are parallel
- iv. The second step follows, during which the body is in a bent position, the arm is extended while the hand rotates and the bocchia comes into position under the arm
- v. In the third step, the body is extended forward, the hand is fully rotated and preparation for the swing begins, whereby the hand that was slightly in front of the body begins to move along the

- body downwards in the swing
- vi. The arm that balances the trunk also makes the swing
- vii. During the fourth step, the hand retracts from the highest point of the swing
- viii. The fifth step takes us high, up to the highest point of the shoulder swing horizontal to the ground
- ix. With the sixth step, the ball is tossed from the highest point of the forward swing (the arm descends from the highest point forward), while the body remains in the same position as during the point
- x. At the same time, the foot follows the hand and takes the sixth step
- xi. After throwing the ball and following through with a straight movement, the head should remain directed towards the target without any jerking of the head in various directions

## **MOST COMMON ERRORS WHEN ADOPTING THE ELEMENTAL TECHNIQUES OF BOCCE**

The most common error while performing pointing and expulsion is most certainly poor head position.

### **POINTING**

1. A poor head position leads to imbalance of the body from the central axis and an undesirable deflection of the trunk
2. Undesirable leaning and covering the head results in losing focus from the target
3. Inappropriate distance between the landing leg and the leg for maintaining balance
4. Bad shoulder position in relation to the ground
5. The body's center of gravity is too low, which leads to the inability of tracking the ball after the throw
6. Lateral and vertical body movements due to improperly distributed weight on the landing leg and improper positioning of the arm
7. Pronounced forward bend (projection of the shoulder line falls below the level of the hips)
8. Untimely release of the bocchia from the hand
9. Weak expulsion

### **EXPULSION**

1. Bad head position leads to an imbalance of the body from the central axis
2. Improper head position leads to an undesirable deflection of the trunk and lowering and raising of the shoulders
3. The head is raised immediately before the ejection, which also affects the trunk and, consequently, the field of vision
4. The hand begins prematurely descending from the upper point of the swing
5. The final step is too long
6. Throw is too short or an uncontrolled ejection

Improvement of specific movements for pointing and breaking out with special emphasis on the correct holding of the ball, optimal movements of the limbs and load distribution, placement, swing and ejection of the ball itself, as well as monitoring the thrown ball, are of key importance in the younger age groups, where every correct automated movement is evaluated multiple times.

## INSTRUCTING YOUNGER AGE GROUPS

When teaching younger age categories, the most important thing is to have a timely influence on the optimal performance of technical requirements when pointing and breaking out.

### POINTING

1. Exercises to promote balance and defining one's center of gravity such as standing on one leg (balance board, walking on narrow beams, walking on a rope, jumping, and jumping on one leg.
2. Maintaining a balanced position in a specific pose or stance
3. Throwing tennis balls just for the sake of feeling the weight on the object in one's hand
4. Tossing the object below the shoulder level to a given distance
5. Throwing the bocce ball
6. Practice visually focusing on an approaching object on a visual apparatus

### BREAKING OUT

1. Athletic training (skipping, doing lunges)
2. Training to increase one's coordination
3. Breaking out with two steps
4. Breaking out with four steps
5. Breaking out with six steps
6. Mastering the four speeds of breaking out
7. Success in hitting the jack with a special emphasis on running speed, body speed, hand speed and the speed of one's fist



Exhibit 11. Children in the school of bocanje

## Revitalizing Traditional Sports and Games.



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