

Lviv State University of Physical Culture named after Ivan Boberskyj

Department of shooting and technical sports

Subject

*"Theory and Methodology of the Selected Sport
and Improvement of Sports Skill – archery"
for 4 courses students*

LECTURE:

**"ACTIVITY DESCRIPTION
AND ARCHER'S SKILLS"**

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ACTIVITY DESCRIPTION and ARCHER'S SKILLS

1.1. The archer's task

1.1.1. Physical task

Archery consists of *shooting arrows with accuracy and consistency to the centre of a target*. To give a simplified physical view, the archer's task is to:

- Repeat an action that will consistently place the arrow in the same spatial position.
- Provide an equal "push" to the arrow shot after shot.



In other words, arrow after arrow, the novice has to:

- Recreate an identical body posture; hence to repeat:
 - All the actions that are required to reach the stage of releasing the string
 - The positioning of all the parts of the body in relation to the target
- Release the string in an identical way.

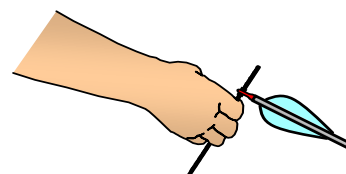
To achieve this twofold process, the novice has to repeat multiple tasks and do them correctly, which will help to make it easier to reproduce them accurately.

To establish correct shooting technique the novice has to consider not only the bow (as the source of the energy that propels the arrow) but also the consistent body alignment and repetition of all the other required actions. Only strict attention to these points will result in consistent arrow flight, and thus accuracy.

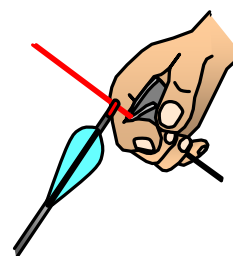
Coaches often begin by helping the novice to develop and repeat a shooting sequence. For this purpose this manual describes the most popular techniques used today, which coaches can use to build an efficient shooting sequence.

In this manual we have mainly used the "shaft aiming" or "straight line aiming" technique. In this method the bow does not have a sight and the archer hooks the string underneath the arrow using the first three fingers of their string hand. But the archer's task and skills are similar whatever the selected aiming technique, including the use of a sight.

Technically the most important aspects to be considered are roughly outlined in the illustrations below:



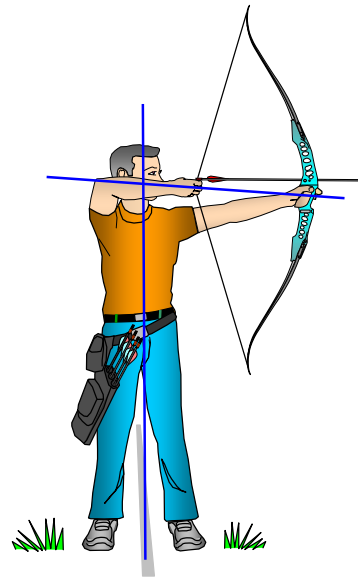
Place the three fingers on the string; also called "hooking". The string fingers should remain stable on the string during the shooting process.



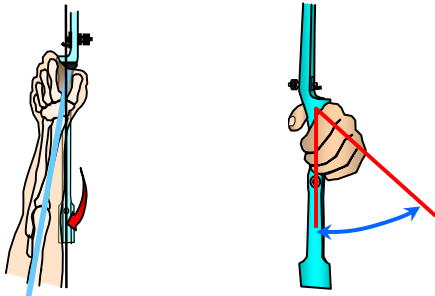
A deep hook, allowing at full draw the string to settle deeply into the joint furthest from the hand, promotes string hand consistency. The palm should be quite relaxed, allowing the back of the hand to be flat (no bent knuckles), the thumb and little finger are to be kept relaxed.



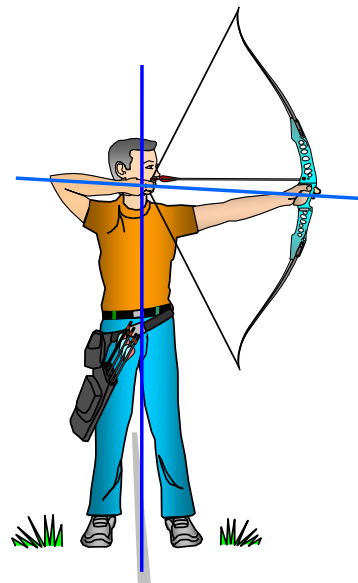
Stand tall with a stable and powerful central body. The body weight should be distributed evenly over the two legs, with the feet approximately shoulder width apart – in a square stance – and with less weight on the heels than on the toes.



The draw is achieved through a balanced action from the bow and string sides, without any change in the head and body position. Only a slight improvement of the alignment of the shoulders with the bow arm takes place.



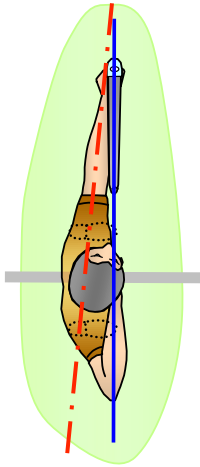
Put the bow hand on the bow grip making sure the knuckles make an approximately 30 to 45 degree angle with the riser and the elbow is rotated away from the string. The bow hand should remain stable on the bow grip during the shooting process. The bow should press along the long bones of the forearm (the forearm axis).



On the pre-draw have the centre line of the body upright, with:

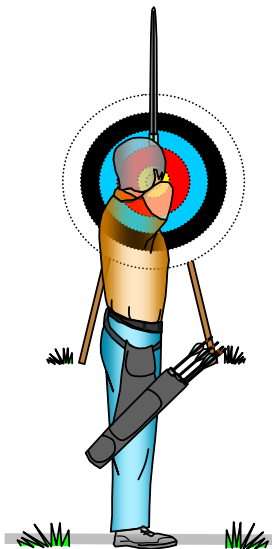
- The shoulders aligned with the bow arm.
- A straight line from the pressure point on the bow grip through the drawing fingers to the tip of the string elbow.

At full-draw the novice should maintain the upright body, with a straight line from the pressure point on the bow grip through the drawing fingers to the tip of the string elbow. The next two illustrations further demonstrate the proper posture.



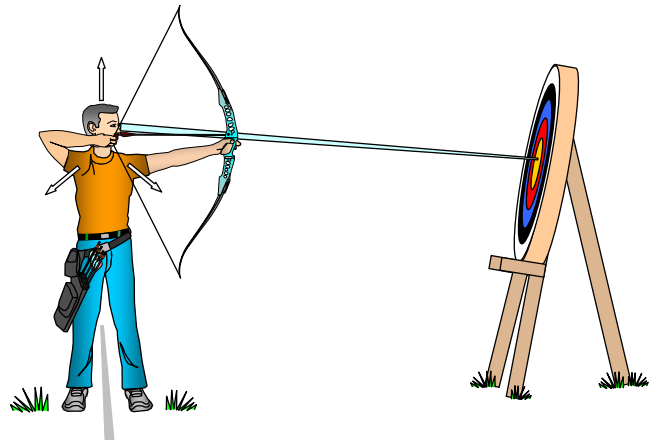
Looking down from above there should be two straight lines from the pressure point on the bow grip through:

- The bow arm and the two shoulders, and
- The bow hand/arrow to the tip of the string elbow.



Looking from behind; the bow should be vertical, with the shoulders and hips in line with the target (square stance). The string elbow is aligned with the string and the centre of the bow.

Note: the lower back is flat.



While aiming the novice must:

- Either resist the spring effect of the bow (without clicker)
- or, increase draw length a little (with clicker)

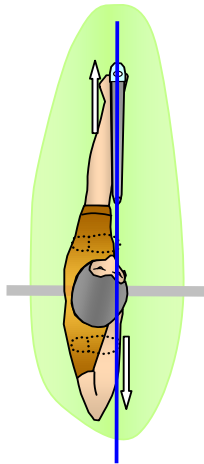
Hence he/she has to provide an extension effort either isometrically (without any move like without a clicker) or concentrically (with move, like with clicker).



During the release the only movements should be:

- The bow arm extending a little toward the target. This extension should be from the follow-through activity of muscles and not be a deliberate push of the arm towards the target
- The string hand moving away from the target, along the arrow axis; hence sliding along the jaw or neck (depending on the sighting technique).

The next illustration further demonstrates proper follow through.



The backward movement of the string arm is the continuation of the muscular activity from the back and posterior part of the string shoulder despite the fact that the string fingers have released the string.

To achieve the above suggested technique the bio-mechanical abilities of the novice must be taken into account. The novice must be coached to the bio-mechanical attributes of their body and not to a technique they cannot physically achieve.

A simplified description, such as the one above, cannot be complete.

The actions repeated by the novice to draw or open their bow, not only during the draw but also during the aiming sequence must be taken into consideration. Therefore, to be more accurate, the novice should repeat the entire shooting process – which encompasses all of the shooting sequence, including all positions and actions executed by the novice when preparing for and accomplishing the shooting routine – in a regular and consistent manner. This routine will be covered in more depth later in this manual.

When we consider what a novice has to do according to a simplified analysis, we can understand that a simple, easily reproducible shooting technique is most effective in giving similar results with each arrow shot. Nevertheless there are several positions and ways to open (draw) the bow and release - in other words "shooting

techniques" - that can be used efficiently in archery. What is important is the quality of the repetition, not necessarily the technical attributes of the novice, providing that the fundamental actions are realized correctly by the archer.

1.1.2. The Coordination of the archer

Accurate aiming does not guarantee a good shot!

A misconception of most novices is "*I have to aim accurately at the centre of the target to get my arrow there*". Any experienced archer, know well that precise aiming cannot guarantee a good score.

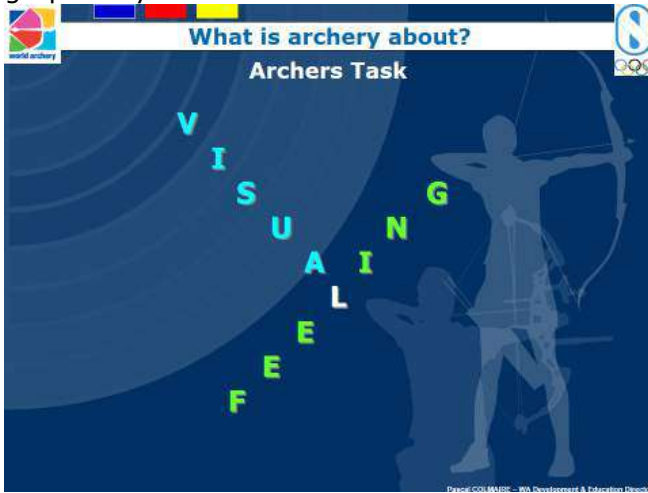
A good shooting action and an efficient shooting sequence involve the interaction of input and impressions from different senses. These sensations and reactions include the visual picture of the sight, the *feel* of the body, the mental state and an awareness of the environment. The novice has to consider all of these factors and should release the arrow only when satisfied that each one has reached an optimal stage. The way a shot feels is important as the novice cannot see himself and has to rely on the feedback from muscles to evaluate each shot.

Each of the above can be considered as:

- Visual picture or references: what the novice can see, such as the sight floating in an acceptable zone over the centre of the target face, the string alignment and the bow held in a vertical position
- Feel / FEELING references: what the novice can feel during the whole shooting sequence (from the start of the draw until after the release), from two sources:
 - Physical: the *sensations related* to movements, body position and stability such as balance, body alignment, head position, positioning on facial marks/anchor point, draw effort with tension and relaxation. This is an important component of good shooting
 - Mental state: confidence, concentration and focus, freedom from distractions, stress level

- Awareness – of the environment, safety, competition timing

The interaction of all of these physical, mental and awareness senses are illustrated graphically below.

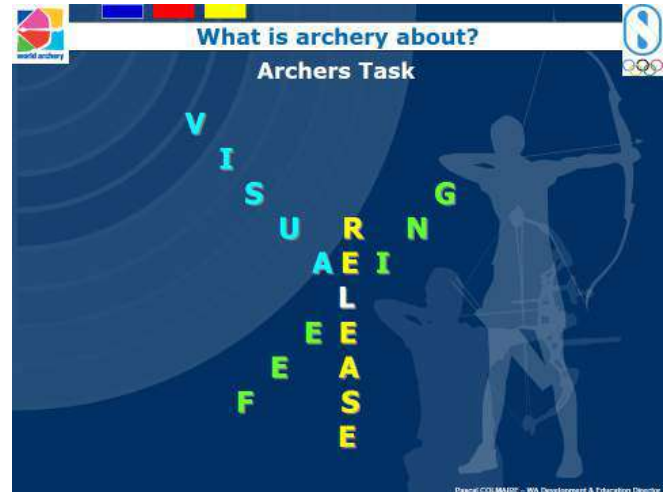


The coach will help the novice to identify, develop and organize all the necessary feelings and all types of sensations: *joints and body position, relaxation level, body balance, stress level and confidence level, etcetera.*

The visual picture and visual awareness of the environment will interact with the physical and mental feel of the archer's body.

It is important to start coaching the novice toward the development and enhancement of the body and joint positions, body balance, and the archers' strength, keeping in mind the biomechanical structure of the archer.

Once the novice is aware of what these factors are, what their impacts can be and is able to then combine them into a consistently repeated shooting sequence, they will have to learn to release the string *during* the time that all of them are close to ideal



When the optimal interactive position has been reached, the arrow is released. To release the arrow before the optimal position has been established will not result in a good shot and is likely to lead to the development of faults in style.

The more stable novices are in their stance and the stronger they are at full draw, the visual-motor (or vision-feeling) coordination whilst aiming occurs more often and lasts longer when it does occur. The result is that the novices can release with more confidence and control. Confidence and control are two important criteria of success in many activities.

If the novice is weak and unstable they may not be able to produce or maintain this feeling of the coordination of factors. A release executed only on the visual references (aiming) will rapidly lead the novice into "Target Panic"; a serious problem that will be covered later in this manual.

During and after the release, the archer must follow-through, maintaining the body position and other visual and physical sensations. The follow-through is an important part of the shot and the arrow is only considered shot well when the follow-through has been accomplished correctly.



The Release must be done WHILE MAINTAINING the quality of the motor-visual coordination.

The release should only occur during the archer's visual and feeling coordination range.

During the release process the quality of the vision-feeling combination of the novice should be perfectly maintained, even during the acceleration and propulsion of the arrow by the string. The shot must be controlled and orientated toward the centre of the target. Hence the novice must strive to maintain the harmony of vision and feeling. In other words: a perfect continuity of all the archer's skills (mental, physical, visual and respiratory) must be ensured during the release of the arrow until it has completely left the bow.

A subconscious or automated release contributes to maintaining the quality of the vision-feeling combination of the novice during the release of the arrow and through its initial stages of flight.

Whatever the natural skill of a person, experience has shown that almost anyone can become a good archer provided much well-structured practice is done. Thus the novice must be attentive in their practice and perform the above tasks consistently in order to improve as an archer.

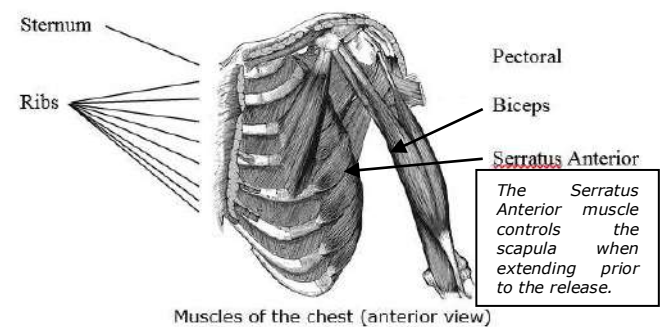
1.1.3. Another task of the archer: force production

As in many sports there are some exertions to be made in archery. Any change in the production of these efforts (e.g. intensity,

direction...) will generate a different shot and thus a different impact on the target. Here are some key points in the correct production of the requisite forces.

a) Repetition of the forces on the bow and the string.

- Should allow the correct feel for the novice to be established
- Some force is required to use a bow but there should be minimal body tension.
- Like in any activity with an apparatus, the coach will teach the beginner to be relaxed on this device
- Usage of the arm muscles should be kept to a minimum
- Shoulder and back muscles should be used for drawing the bow and extending prior to the release
- While at "full draw" the extension should come from scapular motion (not the arms or hands)



Side of the bow arm for right handed archer

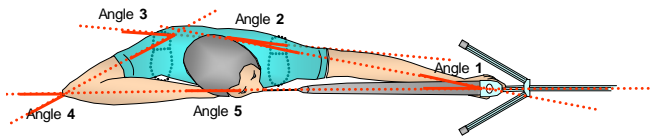
b) Force alignment

- The novice must align the body and shoulder girdle correctly to produce a consistent draw length.
- Correct body alignment helps reduce the onset of fatigue.

c) The angles to be considered for correct body alignment

Because the riser and the string apply opposed forces in the "shooting plane", the novice must also provide efforts on

the riser and the string. Doing so as close to the plane of bow's forces as possible is called being "aligned".



- Angle 1, the angle between the bow arm and the power line should be kept to a minimum, bearing in mind good string clearance.
- Angle 2, the angle between the bow arm and the shoulders should be as close to 180 degrees as possible to get maximum power in the bow shoulder.
- Angle 3, will depend on the length of the archer's string side upper arm and forearm. It is not so important but if possible it should be kept to a minimum that the body will allow.
- Angle 4, this should be kept as small as possible. It is important to maintain the power line from the pressure point on the bow grip through the drawing fingers to the tip of the drawing elbow to ensure an efficient release and follow-through.
- Angle 5, this should be as close to 180 as possible, the back of the hand should be straight and in line with the power line. This will ensure there is no torque applied to the string during the expansion phase.

This body/bone alignment allows for less muscular activity to handle the bow weight. Muscles are therefore more available for control and stability purposes (see the next section "Stable efforts"). This alignment also contributes to a proper direction of the string, particularly upon release. Nevertheless this body alignment could be an issue for the string clearance. The coach should assist the novice to encounter the best compromise in this matter (techniques to handle this compromise are given in this manual).

d) Stable efforts

Since archery is based on accuracy and stability, the coach has to assist novices to generate stable efforts. This can be achieved through a combination of technical developments and strength development. A novice using a low percentage of his/her strength is usually

much more stable than a novice using a high percentage of his/her strength. Hence a high strength potential has to be developed.

The above points make up the *technique*, which is mastered by repetition. Some people say "as long as you do the same thing time after time almost anything can work". However, the wrong use of the body can introduce errors even if repeated consistently. In fact, to repeat a wrong action does not necessarily mean to obtain good results. Novices must perform each action correctly and only a very intense repetition training routine can reduce the number of conscious controls: this is known as "automation induced by muscle memory".

1.2. The archer's skills

The skill of the novice is not in shooting one arrow correctly, but to repeat it time after time. The only way this can be achieved is to train the body and mind of the novice to accurately repeat a shooting routine, even under fatigue and/or stress. The areas to be considered when training to do this multi-functional task are:

- **Strength:** to operate the bow without any stress or strain.
- **Static Stability:** to be able to keep a stable stance while shooting.
- **Dynamic Stability:** to be steady while aiming (no tremor in the upper body at full draw).
- **Visual Focus:** to be able to stay visually focused no matter what distractions may occur.
- **Mental Focus:** to be able to stay mentally focused on the task at hand under all conditions.
- **Inner Body Feeling:** to be aware of the total and correct feel of shooting the bow and, therefore, of any position, movement and effort generated in the body during the shooting process.

In addition to the above requirements the following points need consideration if the novice is to have a complete training routine.

- **Psychology:** to keep the mind focused on the task at hand.
- **Relaxation:** to be able to keep calm in stressful situations.
- **Concentration:** to be able to ward off irrelevant distractions when performing.
- **Positivism:** being confident that he/she will perform well no matter what situation may occur.

Also, short term and long term goals are essential for planning progress. These goals help in the development of all archers whatever their level of expertise. Whatever goals are set they must be:

Specific
Measurable
Achievable
Realistic
Timed
Exciting
Recorded

In conclusion a coach is responsible to develop several habits in each athlete they work with. The level 1 coach assists the beginner in the consistent repetition of a shooting sequence built on biomechanical principles. A strong foundation is designed to achieve this consistency under the load of bow weight. Strength, stability, inner body feeling, mental focus and concentration, and relaxation are other components that are developed as a part of the program. A coach works with both body and mind to develop a better person as well as an efficient athlete.