

## 6.13. STRING CLEARANCE

### 6.13.1. Tests

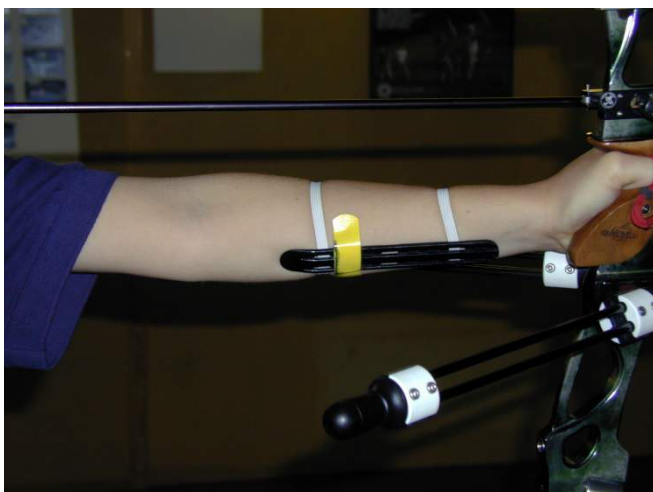
#### String Clearance of the Bow Forearm - Test

With no hand on the string, raise the bow and check where the string is located on the armguard or forearm. About 12 mm in front of this spot (i.e. towards the bow) affix a piece of tape or an adhesive bandage which protrudes about 2 mm in the middle (bridge shape). The bridge of the tape should be fixed vertically, across the bow forearm/armguard, parallel to the string.



A bridge of tape is an efficient way to check string clearance.

Mark the side of the tape closest to the string with a pen (it is best to make the mark before sticking the tape on the armguard). This mark will help to identify if the string hits the tape while pushing the arrow or on its way back.



Shoot an arrow with this tape in place - make sure the tape-bridge is not flattened out before the draw. After the shot, look at the tape and analyse any damage to it (if any).

#### String Clearance at the Chest – Test

Either with the novice watching him or herself in a mirror, or with the help of an assistant, observe at full draw where the string touches the chest, if it does. About 12 mm in front of this spot fix a piece of tape that has a bridge shape - 2 mm raised in the middle (an adhesive bandage is fine).



Checking chest clearance with a bridge of tape.

The most critical point is the edge (hem or trim) of the chest guard surrounding the bow shoulder. The bridge of tape should be fixed parallel to the string on the chest-guard. Shoot one arrow with this tape in place - pay attention to not flatten out the "bridge" part during the draw. After the shot, analyse any damage done to the tape.

The following exercises will help to improve form and generate better string clearance. It is possible that poor string clearance may be caused by more than one issue. Thus it may be necessary to use several of following elements to attain good string clearance.

### 6.13.2. Rectifications and Some Exercises to Improve the String Clearance

If poor string clearance has been detected using one or both of the above tests, proceeding with the following rectifications and/or exercises in the following order is suggested.

#### Clothing Issue at the Chest or Sleeve - Rectification

Tighten the garment sleeve at the forearm and at the top and along the bow arm at shoulder level using pins, bands or tape.



The use of a chest-guard is often efficient as well.



#### Bow Shoulder Alignment – Rectification

The bow shoulder joint should be kept in line with the string shoulder and bow hand, not pushed in towards the string.



The bow shoulder should not be more toward the toes than in the example above. Below are some reminders on how to teach proper bow shoulder positioning.

#### At the pre-draw:

The joint should remain above the hipbone on the bow side. Moving this joint toward the string drastically reduces the string clearance. The bow arm may rotate clockwise (for a right-handed archer) in the shoulder joint, so long as the joint remains in the correct location.



It should also be pushed down and forwards.

Ask the novice to put the bow arm on an assistant's shoulder. Have the assistant manipulate the novice's bow arm with an inward rotation of the humerus head and a gentle pull away from the body.



Ask the novice to close his or her eyes in order to better feel this shoulder positioning.

Then ask the novice to implement this form while using an elastic band.



The assistant may manipulate the arm again if necessary. When correctly positioned, ask the novice to close their eyes to get a better feeling of the correct posture. Then use a mirror to allow the novice to see their arm properly positioned.

Repeat with the bow but no arrow; then with an arrow and shooting.

The coach must check that the bow shoulder is not brought too much inside (towards the arrow) during the draw and during the extension (full draw) actions, a common error for novices. The following exercises can help correct a bow shoulder that moves too far to the inside.

#### During the draw:



Position an arrow vertically against the front side of the bow shoulder of the novice during the pre-draw, holding the arrow with one hand at each end. Keep the arrow as still as possible during the draw action. A slight inwards motion



of the bow shoulder is acceptable for getting the bow arm and the shoulders aligned, particularly in case of a short pre-draw. That said, the bow shoulder should remain above the hip, not further inwards (towards the toes). Ask the novice to draw with their eyes closed while the assistant helps with the vertical arrow to promote a better feeling of control and awareness of the bow shoulder position during the draw.

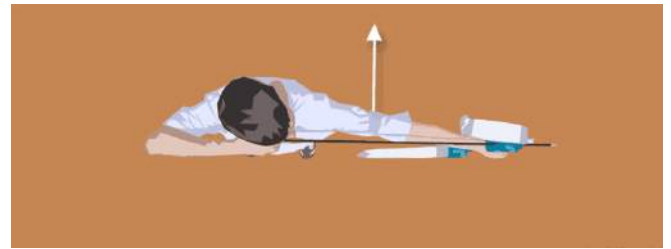
### During the extension (full draw):



From the pre-draw, set up the shot as described in the previous situation. Once the novice is at full draw, firmly hold the arrow in place with one hand at each end. Keep the arrow still during the extension action, until one or two seconds after the release. Many novices have a tendency to twist their entire upper body instead of an extending in the arrow axis, particularly when learning to use a clicker. If this twist happens, the string clearance is dramatically reduced. Ask the novice to extend with the eyes closed while being assisted with the vertical arrow; it will help to better maintain the bow shoulder (and entire upper body) while extending at full draw.

### Bow Elbow Orientation – Rectification

The bow elbow should point away as shown below:



If the bow elbow is not properly oriented this exercise can teach the novice how to properly rotate it.

### Volleyball player:



Simulate the volley-ball player position as shown above.  
Now have the novice rotate their elbows so that the points are directed away from each other as shown below.



This is the proper position of the archer's bow elbow while shooting. Have the novice repeat this, with decreasing dependence on the linked hands, until they are able to do it with their hands separated.

Against a support:



For most people, an elbow pointing down generates poor string clearance. Have them rotate their arm, with help if necessary, to bring the bow elbow to the vertical position shown below.



This elbow position provides an optimum string clearance. Have the novice repeat the turning of the bow arm him/herself multiple times, decreasing the amount of assistance given. Let them continue the exercise with their eyes closed to better learn the feeling of the proper bow elbow position.

Next do it using a support and an elastic band. If properly done, the novice should be ready to adopt a correct bow elbow position on their bow.

## Bow hand position – Rectifications

### Bow Hand – Exercise 1

#### Objective:

To discover a bow hand position that is easy to replicate; solid, not tiring, relaxed, and allowing an efficient pursuit of the shooting process, including good string clearance.

#### Situation:

Shooting situation.

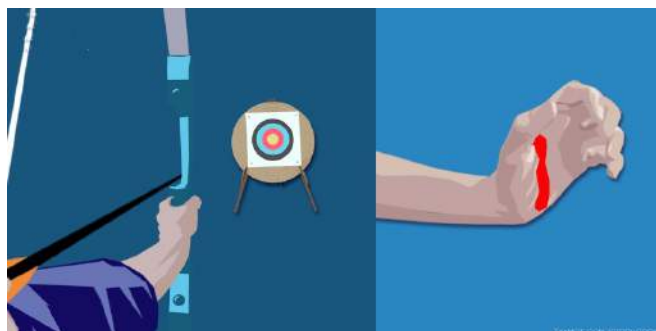
#### Equipment:

Bow.

#### Instructions:

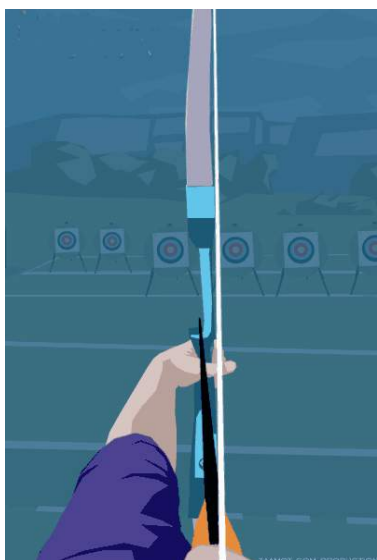
Have the novice try different bow hand positions, and notice:

- The obstructed string displacement when the palm of the bow hand past the life line presses against the bow grip; and



String clearance is poor when the palm on the little finger side presses against the bow grip.

- Any discomfort and the tiring nature of the position when the string is pulled slightly with the bow grip pressing against the base of the thumb.



An unstable and tiring grip occurs when the bow hand position is out too far and pressing the thumb against the bow grip.

Many beginners adopt the unavailing bow hand position shown in the previous illustration to avoid their forearm getting hit by the string. Since the pressure point on the grip is moved to the left (for a right-handed archer), it generates a bow torque during the propelling process that deviates the bow string toward the bow forearm; hence no gain, but still pain!

A recommended position is shown in the illustrations entitled "A good bow hand position"; this provides a support zone between the lifeline and the base of the thumb.



A good bow hand position.



A good bow hand position.

String clearance is optimal when the palm on the little finger side of the life line is not in contact with the side of the bow grip.



A good bow hand position.



## Bow Hand – Exercise 2

### Objective:

To discover a stable bow hand position that allows an efficient pursuit of the shooting process, including good string clearance.

Situation: Simulation.

Equipment: A piece of string or a bow.

### Instructions:

To discover the contact zone on the grip-hand, ask the novices to pull a rope or rubber tube as shown in the next illustration:

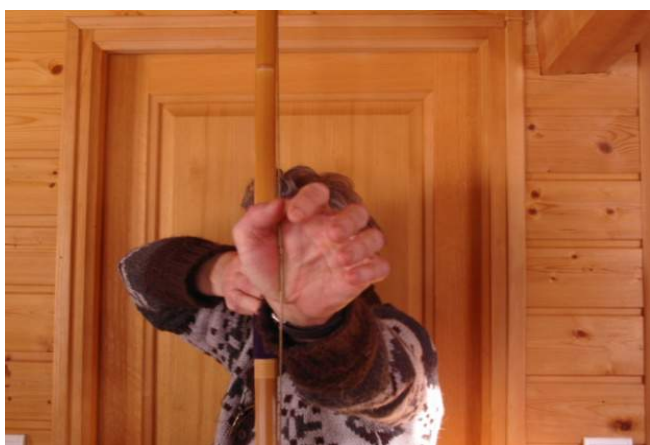


The coach should check if the rope is pressing on the proper part of the bow hand. If necessary, correct the location of the rope or rubber tube.

The novice should feel:

- The stable alignment of the bow hand;
- Where the pressure zone is located on the hand.

Then ask the novice to use a bow back to front, with the bow hand holding the string and the string hand holding the bow.



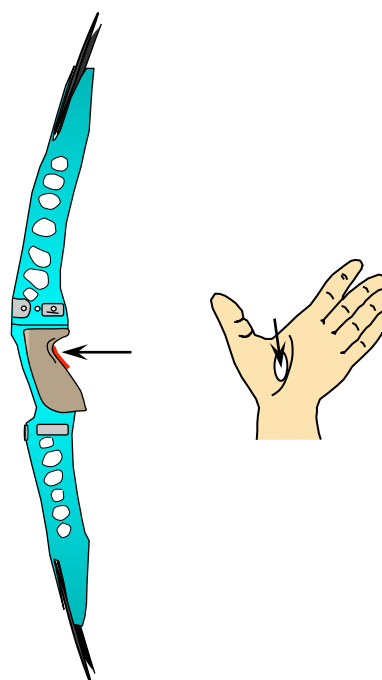
If the string is properly placed, the novice can keep the bow hand relaxed and the bowstring does not roll out of the bow hand.

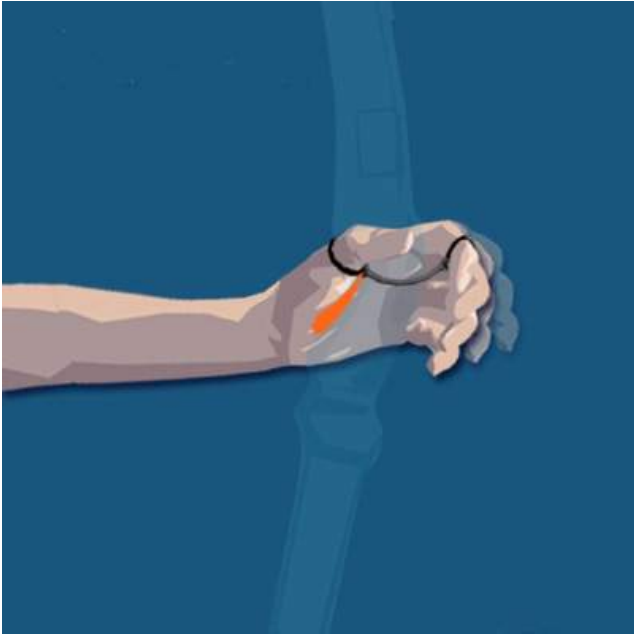
Another simple and efficient teaching aid is shown below:



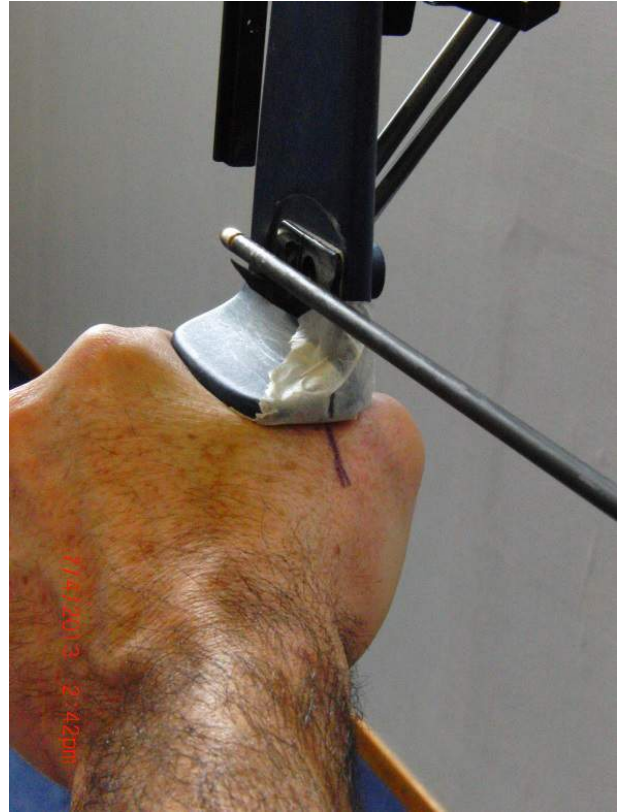
At this point, ask the novices to demonstrate a proper bow hand position with their bow.

Have them shoot with their eyes closed to feel the correct bow hand position.



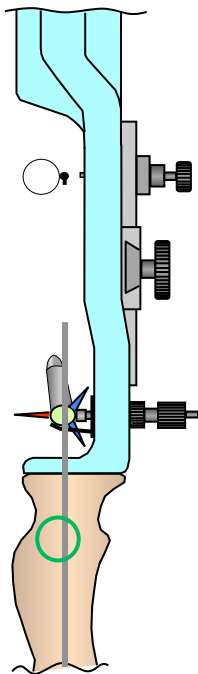


Another visual aid in consistent bow hand positioning is a line drawn on the bow hand and the bow, as shown below.



**Reminder:** The use of a bow sling is fundamental to the proper setting of the bow hand on the bow grip. Without a bow sling, the novices usually grip the bow with too much force.

The pressure of the bow hand on the riser should not be on the window side, but rather a little on the opposite side of the bow grip.



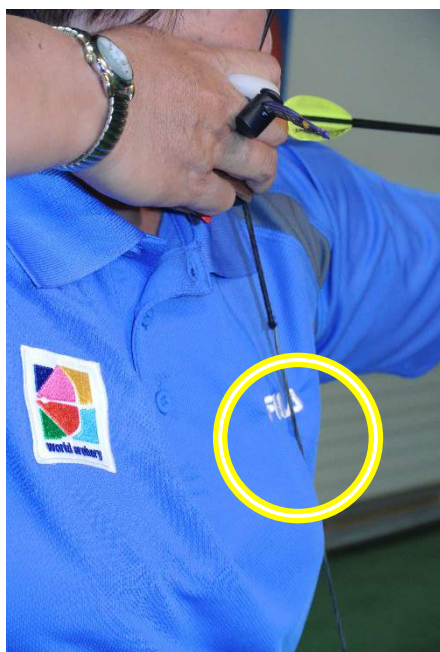
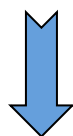
If necessary, glue a piece of thin sandpaper to the main pressure area of the bow grip. This will help the novice set the bow hand in the same location on the grip for each shot.



## Canting of the Body with Respect to the Target – Rectification

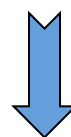
**Note:** The following pictures show exaggerated leaning for visual impact and ease of understanding.

When leaning back (towards the string foot)...



... the string often presses into the chest.

When leaning forwards (towards the bow foot)...



... the string presses less on the chest.

Thus, attention should be paid to an upright and erect body position and spine in order to generate good string clearance.

## Leaning of the Body Forward/Backward (toes/heels) – Rectification

**Note:** The following pictures show exaggerated leaning for visual impact and ease of understanding.

With a lot of body weight on the heels...



... string clearance is often poor at the chest.

With more body weight on toes than on heels...



... there is often a better string clearance at the chest.

In general, the weight should be slightly more towards the toes than the heels for optimal stability and string clearance. Be aware that too much or too little weight shifted forwards results in reduced body stability, so the correct balance must be found for each archer.

## Positioning of the Lower Back – Rectification

A curved lower back often generates string pressure on the chest because the chest is raised and inflated.

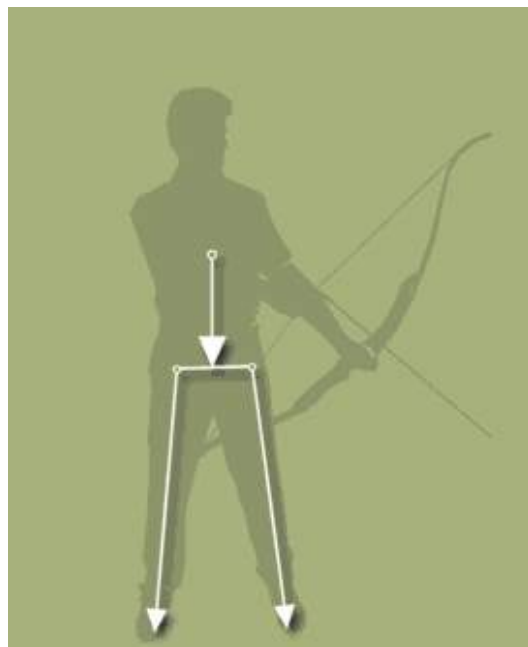


Shooting with a flat back often clears the chest from the string path, because the chest is usually flat and low.



## Height of Energy – Rectification

Lowering the energy in the belly helps to flatten the chest, and is also good for body balance (because it creates a lower centre of gravity) and for staying relaxed.



To promote a low centre of gravity, place a long stick between the ground and the novice's belly. Ask the novice to keep a "heavy" belly in order to apply some pressure on the stick.



The belly pressure on the stick must be maintained for the duration of the shooting sequence.

The goal is to keep the energy and centre of gravity down for body stability. It also contributes to a flat chest and low shoulders.

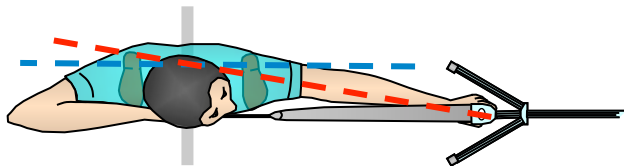


## The Angle Between the Bow Arm and the Line of Shoulders - Rectification

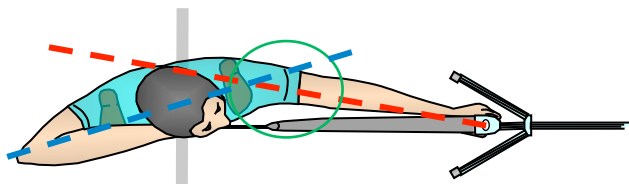
If, despite attempting all of the above, there is still poor string clearance - and only in this case - consider creating an angle between the bow arm and the line of shoulders of the novice.

It is achieved by a change of stance:

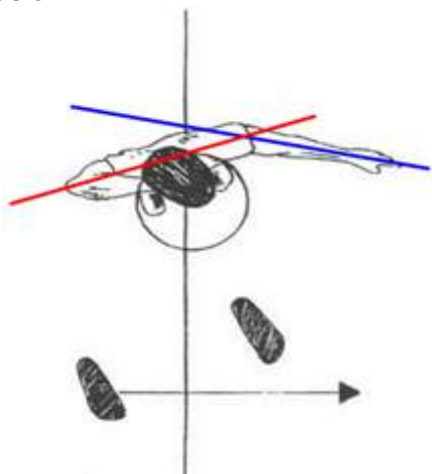
**From:**



**To:**



Whatever the change in stance, the novice should keep the shoulders above the hips and feet to move the bow shoulder away from the shooting plane (hence the path of the string) as shown below:



If, instead, the novice keeps the shoulders aligned with the bow arm and in the shooting plane, the string clearance will not improve; hence the change in stance will be ineffective. This broken line between the shoulders and bow arm is mechanically, hence physically, much more demanding for the novice.

In the last illustration, the novice has moved both feet, to keep them parallel. This rotation of the entire body is a good alternative to keep optimal balance from toes to heels.