Chapter 7 – Fine Tuning the Physical Game

Overview

Introduction

This chapter is divided into three sections. The first section introduces concepts a coach should understand when developing the physical game. A review of the importance of the “athletic pose” completes this section. The second section identifies the components of the physical game. The chapter’s final section explores the relationship between the position of the ball to the movement of the body. This relationship is known as timing.

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Section 1 – The Physical Game

Overview

Introduction
This section introduces concepts coaches should understand when developing their athletes’ physical game. A brief review of the athletic pose, preset and the coach’s eye will complete this section.

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About the Physical Game

No Exact Rule

There are basic concepts and mechanics taught to help maximize an athlete’s game. These items should not be used to create the perfect textbook bowler, as there is no such thing. The coach should use these basic concepts and mechanics to help an athlete achieve his or her own personal excellence in the sport.

The problem in our sport is coaches who do not understand that they should not clone, cookie cut or boiler plate all athletes to bowl exactly the same. There is no magic one-size-fits-all solution. The rule is, “there is no exact rule” when matching individual styles and abilities to the components of the physical game. Everyone has his or her own physical abilities, perceptions and ways of accomplishing a task or motion. After all, that’s what makes each of your athletes an individual.

Consistency and Change

The development of consistency in the physical game is the No. 1 priority of a coach who is working with beginning and intermediate-level athletes. When an athlete has no rhyme or reason in his/her set-up, approach and delivery, the results will usually be ugly. Be patient and positive with your athlete through this process.

Understand that while some athletes will have very few problems making changes to their physical games, there will be other athletes for whom it will be a difficult proposition. Remember that each athlete is an individual who will learn and develop at his/her own rate.

When the athletes learn a new motion or new activity, teach them that they are replacing an existing habit with a new habit. According to studies done at the United States Olympic Training Center, it takes more than 1500 repetitions before a new habit becomes second nature.

Until the body has had sufficient opportunity to learn and replace an old motion with the new motion, there always will be that chance, particularly under pressure, that the body will revert back to its old and familiar motion.

As you work with your athletes, remember not to overload them with everything that you find. Prioritize the items of concern – deciding which one or two items need to be addressed first. When working with your athletes: 1) identify the problem you are addressing; 2) advise them of the benefits of making the change; 3) explain the corrective action.
The Beginning Stance

Athletic Pose

In the Level 1 Coaching Manual, the importance of the beginning stance, or the “athletic pose” was introduced. The value of the athletic pose is to prepare the athlete to deliver the bowling ball. The key to success is to minimize the number of movements and adjustments that an athlete makes from the stance to the finish position.

Presetting

When an athlete has excessive movement throughout the approach, this will increase the chance for producing an inconsistent delivery. Presetting as much of the body into the finish position, in the stance, will reduce the number of actions an athlete will make before delivering the ball. Remember, the goal is to make a smooth, clean delivery, which will be very difficult for the athlete to achieve with an excessive to-do list.

Coach’s Eye

The introduction of the coach’s eye concept is used to help coaches analyze their athletes’ delivery of the bowling ball. This process views each athlete using the following four different reference points:

- Waist down
- Waist up
- Ball position
- Hand position
Section 2 – Components of the Physical Game

Overview

Introduction

There are many components that make up the physical game. Your next challenge is to gain an understanding of the importance of these components and how to properly match them to your athletes’ games. Keep in mind that all these parts must work in concert with the rest of the body to deliver the bowling ball.

As you begin to teach your athlete these physical game components, it is important to allow him or her to learn the specific motion you are teaching. An athlete must be able to see the action in his or her mind and the body must understand what this motion feels like. If the mind cannot see the action and the body does not know what the motion feels like, then there is no way for the athlete to execute the movement being taught.

This section addresses the concepts and basic body mechanics that will help your athlete improve his or her skills within the following approach and delivery components of the physical game:

- Ball Start
- Tempo
- Armswing
- Wrist position
- Release
- Finish position

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Ball Start

Description

The initial movement of the ball and armswing is known as the **ball start**. When discussing this initial movement, it is important to remember that the bowling ball is an object heavy enough to influence the overall movement of the body.

Proper placement of the ball in the stance will increase the athlete’s ability to have a loose, free armswing. In addition to noting the horizontal and vertical placement of the ball, awareness of how close or how far the ball is to the body is an important factor in creating a tension free armswing. If the ball is placed too far in front of the body there will be a tendency to tighten the muscles in the arm to hold the ball.

This initial movement should be just enough to get the ball into the swing.

Items to consider regarding the ball start include:

- Length of ball start
- Force exerted
- Vertical movement

Each of these items is detailed in the information that follows.

Length of the Ball Start

The distance that the ball moves away from the body may affect the overall motion of the body – particularly if the distance is excessive. Optimally, the ball side arm should extend slightly away from the body, as shown below in **Figure 7-1, Ball Start**.
Ball Start, Continued

**Length of the Ball Start continued**

This extension of the ball should not result in the arm being locked straight out in front of the body. Following this slight forward motion of the ball side hand, the athlete should allow the ball to fall into an arm swing that swings freely from the shoulder.

It is important the athlete understand this initial motion of the ball start does not require that the arm be fully extended away from body. Full extension of the arm and ball away from the body may exert pressure and stress to the shoulders and lower back. This action may cause the shoulders to lean forward as the ball starts down into the swing. The over extended ball start may further compromise the balance and good body posture acquired from the athletic pose.

**Force of the Ball Start**

Another item of concern with the initial movement of the bowling ball is the speed with which the ball is moved away from the body. This movement needs to be smooth and fluid.

An athlete should be taught not to sharply or abruptly launch the ball away from the body. This type of unnatural movement usually pulls the body forward, forcing the body to adjust by taking longer steps to maintain its balance. Any excessive force transferred to the ball will destroy natural movement of the body, placing it into a survival mode.

**Vertical Movement**

The movement of the ball start should be either in a straight out or a slightly downward direction. The purpose of moving the ball in these directions is to develop a loose arm swing.

Until the athlete is able to develop the feel of a loose, free arm swing, it is not recommended that the initial ball start motion move upward. The upward motion of the ball start will require tightening the muscle to generate this movement. Raising the ball upward in the ball start and not relaxing the muscles to allow the arm to swing freely may create issues with timing. Timing will be discussed in **3 – Timing**, later in this chapter.

**NOTE:** The coach should utilize the side view for analyzing the shape, length and speed of the ball start.
Tempo

It's All in the Legs

It is generally understood that the ball knocks down the pins. However, it is the force that is transferred to the ball that truly knocks down the pins. A fallacy exists as to where this power is generated. Many athletes believe that power is generated from the arms or the upper body. In reality, power transferred to the bowling ball is generated from the legs.

Building Tempo

How the athlete takes their steps when delivering the ball is important because of the power they must produce. Optimally the overall tempo of the athlete needs to be fairly aggressive since this motion will translate to energy that is imparted to the ball.

The initial step taken out of the athletic pose is usually the shortest step of the approach. The overall movement of the body needs to be smooth to promote balance and fluid motion throughout the entire approach. All steps following the first step must flow and match the athlete’s loose armswing. The last step, sometimes referred to as the power step, is the longest step in the approach.

It is a misconception that good bowlers have a slow methodical approach. Professional bowlers with many years of experience have an aggressive approach. There is no question watching the pins explode off the pin deck that the professional athlete has imparted energy to the ball. The reason why it doesn’t appear this way is that their movements are smooth and perfectly coordinated.

Ball Speed and Pin Action

Proper pin action only can be achieved if the bowling ball has good momentum when it reaches the pin triangle. Momentum is a product of the mass of the bowling ball and the speed with which it is delivered. In general, you want your athletes to deliver the bowling ball with enough force that, after traveling 60 feet, it will knock down 35 pounds of pins (10 pins at 3.5 lb) in domino fashion.

The main reason to encourage higher ball speed is to create “double pin action” instead of “single pin action.” For right-handed bowlers, single pin action occurs when the bowling ball hits the head pin, the head pin hits the 2 pin, and then the head pin hits the sideboard and drops dead. With double pin action, the head pin will retain enough energy following knocking down the 2 pin to hit the sideboard and bounce back across the deck creating the opportunity to clear additional pins left after a hard or soft leave and usually results in a strike. The likelihood of double pin action increases at higher ball speeds.

Continued on next page
Tempo, Continued

Ball Speed and Pin Action continued

To achieve this ball speed, a fast tempo is necessary during the approach. Encourage your athletes to use a fast, aggressive game. Better pin action, more strikes and better spare conversions will be the results.
Armswing

The Motion

The armswing is one of the most important factors in developing accuracy in an athlete’s game. A consistent armswing rests with the athlete’s ability to allow the arm to swing loosely, freely and naturally. The analogy of a tire swing, as shown below in Figure 7-2, Free Armswing Movement is an appropriate visual that helps the athlete understand how free the back and forth motion of the arm needs to be throughout the entire motion.

The arm must be allowed to swing freely from the shoulder, allowing gravity to do its job. Resisting the temptation to physically help control the direction of the armswing will allow the arm to stay in a consistent predictable motion.

Avoid Muscling

Have your athlete stand where he or she may move their arm without hitting anything. Ask your athlete to swing their arm backwards and forward loose and free from the shoulder. At a point during this motion, have your athlete make a fist. Ask your athlete how clenching a fist affected the overall motion of the arm. Making a fist will tighten the muscles in the arm and shoulder, restricting free arm movement and limiting the range of motion.

When an athlete employs a “grip and rip” mentality, the reduction in arm speed and mobility of the body is accompanied by a corresponding muscling and tensing of the body to try and restore the power that was lost. The result will be inconsistency in the athlete’s game, followed eventual fatigue.

Continued on next page
Armswing, Continued

Analyzing the Armswing

As discussed in Ball Start earlier in this section, the forces that the ball generates could influence the overall movement of the body. The force that the ball exerts during the armswing may be a bit subtler but nonetheless could have a profound affect on the approach and the accuracy of a shot.

As in the case of excessive force being used in the ball start, an improper armswing will create a similar scenario where, the motion of the ball will dictate how and where the shot is delivered.

The Swing Plane:

The armswing motion is likened to a tire swing, as shown on the previous page in Figure 7-2, Free Armswing Movement. This is a great example of an object that is swinging in a geometric plane. When an object is suspended from a fixed point and allowed to swing freely, this object will not change direction and continually occupy this same space or “plane.”

The direction that the arm swings, or swing plane, will generally dictate the direction that the ball will be delivered onto the lanes. For the most part, the direction of the swing plane and direction of the steps to the finish position need to be the same.

One of the major reasons why an athlete drifts during the approach is that the direction of the armswing and the steps are not parallel to each other. When the armswing moves outside of the body during the approach, the momentum generated from the ball will pull the body in that same direction. Conversely, the momentum of the ball from an armswing that moves inside of the body will push the athlete in that direction.

When analyzing the armswing, the coach should use two different vantage points: the back view and the side view. These views are described in the material that follows.

Continued on next page
Armswing, Continued

Back View

The primary points of focus in this view are: 1) the swing plane or direction of the arm swing and, 2) the consistency of the arm swing staying within that plane.

Start in - Ball out - Swing in: The athlete whose ball start moves the ball in towards the middle of the body will tend to swing the ball away from the body on the back swing. This motion will result in the ball being positioned away from the body at the height of the backswing. The result will be that the athlete will miss the target to the inside of the lane as the ball will swing back in towards the body on the downswing as shown in Figure 7-3, Start in - Ball out - Swing in.

Start out - Ball in - Swing out: When the athlete’s ball start pushes the ball out and away from the body, the backswing will tend to tuck in behind the back. When the ball starts its downswing from behind the back, the athlete will usually send this shot out toward the channel, as shown below in Figure 7-4, Start out - Ball in - Swing out.
Armswing, Continued

Swing Plane Consistency:

One of the primary goals in bowling is to develop accuracy that will enhance the ability to score. Accuracy is a byproduct of consistency. When an athlete’s armswing moves in different direction from swing to swing it will create different ball paths down the lane resulting in different outcomes for each shot.

To determine the consistency of the armswing to stay within the plane, stand behind your athlete and hold a pen or pencil in a vertical position in front of you aligned to the ball side shoulder. As your athlete bowls, see what kind of movement occurs off the vertical position. The diagram below in Figure 7-5, Inconsistent Armswing illustrates an inconsistent armswing from the back view of an athlete where the ball does not stay within a consistent swing plane.

An inconsistent arm is caused by a number of items that may include:

- Improper fit
- Improper timing
- Improper weight bowling ball
- Excessive muscling of armswing

Continued on next page
Armswing, Continued

Back View continued

The goal of developing a cleaner swing, where the arm stays within a well-defined swing plane as shown below in Figure 7-6, Consistent Armswing, is to increase the athlete’s ability to repeat good shots and improve accuracy.

![swing plane](image)

Figure 7-6, Consistent Armswing

Side View

The primary points of focus in this view are: 1) the consistency of the armswing, and 2) the type or shape of the armswing.

**Armswing from the Side View:**

When viewing the armswing from the side, a coach is looking at the overall shape of the armswing. Along with noting the shape of the armswing, the coach needs to check to see if this shape is the same from shot to shot. An inconsistent armswing would appear as shown below in Figure 7-7, Inconsistent Shape.

![Inconsistent Shape](image)

Figure 7-7, Inconsistent Shape

Continued on next page
Armswing, Continued

A consistent armswing has very little variation in the shape, as shown below in Figure 7-8, Consistent Shape.

![Figure 7-8, Consistent Shape]

Additional items to observe when working with the armswing include:

- Note where the ball is placed and starts in the Athletic Pose
- Direction of the ball start (parallel, away or inside)
- Excessive motion on ball start
- Sudden acceleration or deceleration of the ball

Types of Swings:

It is important as you view your athlete from the side, that the armswing is consistent; having essentially the same shape and form. The bowler should not have a short swing, a long swing and an intermediate swing; this creates different releases and inconsistencies at the release point. Each of your athletes has different physical abilities and limitations. Your job as a coach is to match the best type of armswing with your athlete.

There are three basic types of swings as you view your athlete from the side:

- Roller swing
- Stroker swing
- Cranker swing

Each type of swing is described in the material that follows.

Continued on next page
Armswing, Continued

**Roller Swing:** Watching this type of armswing from the side, notice that the bottom of the swing is very long and goes for quite awhile during the armswing, as shown below in *Figure 7-9, Roller Swing.*

![Figure 7-9, Roller Swing](image)

The roller swing has a very long, flat part on the bottom of the swing which does not dip down and come right back up. This type of swing encourages a greater roll of the ball and a straighter type game.

**Stroker Swing:** When you watch the shape of this armswing from the side, it resembles the arc of a pendulum, as shown below in *Figure 7-10, Stroker Swing.* The shape is fairly even all the way through the swing. It starts from the top, comes down, runs evenly and comes right back up without a discernible flat spot on the bottom.

![Figure 7-10, Stroker Swing](image)

*Continued on next page*
Armswing, Continued

**Cranker Swing**: Basically, the cranker swing shown below in Figure 7-11, *Cranker Swing*, is a modification of the pendulum stroker swing. The major difference between this swing and the stroker swing is that the cranker swing uses a lower back swing.

At the point of release, the armswing will come up hard behind the ball. This strong upward motion is only with the ball side arm. To create a point where the athlete can generate leverage, the body must remain fixed and not come up with the bowling arm. When viewing this swing and release from the side, notice there is virtually no flat spot in the shape.

**Figure 7-11, Cranker Swing**
Wrist Position

Three Basic Positions

There are three basic types of wrist positions that an athlete may employ:

- Firm (straight – medium)
- Relaxed (broken – minimum)
- Strong (cupped – maximum)

A bowler will develop a primary or benchmark wrist position. However, just as a successful major league baseball pitcher has more than one pitch, a successful bowler must also develop a repertoire of releases. Each basic wrist position gives your athlete additional options to exercise when he or she encounters various lanes conditions.

It is essential the athlete recognize that there are three major wrist positions. Athletes also should understand there are degrees between each wrist position that represent subtle adjustments that may be made in fine-tuning a game. Making subtle adjustments to the wrist position is comparable to a driver adjusting the pressure against the gas pedal to obtain a desired safe speed for their vehicle.

Firm Wrist

Part of the physical game development for the beginner and intermediate athlete must include a straight firm wrist position. Using a firm wrist position gives your athlete a chance to develop a strong rolling ball.

In relation to the ball, the firm wrist position will place the fingers down around the equator of the bowling ball at the point of release, as shown below in Figure 7-12, Firm Wrist. Having the wrist in this position keeps the fingers in the ball long enough to allow the athlete an opportunity to impart potential energy and revs to the ball.

Figure 7-12, Firm Wrist

Continued on next page
**Wrist Position,** Continued

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**Firm Wrist**

The following are characteristics of the firm (medium) wrist:

- Strong rolling ball
- Ability to generate revs to the ball
- Potential to hook the ball

Most bowlers will eventually want to hook, or curve, the ball. This basic wrist position is an essential part of accomplishing this task.

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**Relaxed Wrist**

The weakest position in terms of the potential energy that may be imparted to the ball is relaxed wrist. The relaxed wrist places the hand on top of the ball. With the hand located well above the equator of the ball, the fingers exit the ball earlier, limiting the amount of energy and opportunity to generate revs to the ball.

![Equator](image)

**Figure 7-13, Relaxed Wrist**

The following are characteristics of the relaxed (minimum) wrist:

- Weak rolling ball
- Limited number of revs to the ball
- Straight ball

Athletes wishing to reduce the hook potential of a ball may use a less firm wrist position to accomplish this decrease in movement.

*Continued on next page*
Wrist Position, Continued

Collapsing the Wrist

Establishing and maintaining the firm wrist throughout the stance, approach and delivery is an item that a coach needs to watch. Collapsing the wrist refers to an athlete starting with a strong wrist position in the athletic pose and ending with a relaxed weak wrist at the point of release. Rarely does an athlete have the opportunity or ability to get the wrist back into a firm, straight position at the point of release.

The coach must identify when the athlete collapses the wrist to make an adjustment to correct this power-robbing position. This item of concern may occur as early as the initial movement in the ball start or as late as the bottom of the forward swing.

Major causes of collapsing the wrist include:

- Bowling ball with an improper fit
- Ball is too heavy for the athlete
- Poor set up in athletic pose
- Improper timing
- Habit

Using a wrist device rarely solves the problem and in essence only places a Band-aid over the problem. A wrist device may be used on a temporary basis as a learning tool to help the athlete feel the firm wrist release.

On a permanent basis, a wrist device should be used for athletes who are physically challenged or need the device because of past injuries.

Strong Wrist

The strong wrist position is the most powerful wrist position in terms of imparting potential energy to a bowling ball. An athlete must be fairly strong to position the hand well below the equator of the bowling ball, as shown below in Figure 7-14, Strong Wrist.

![Equator](Image)

Figure 7-14, Strong Wrist

Continued on next page
Wrist Position, Continued

Strong Wrist continued

In this position, the athlete increases his/her chances to impart substantial energy and revs to the bowling ball because the fingers will remain in the ball a longer time.

The following are characteristics of the strong (maximum) wrist:

- Strongest rolling ball
- Maximum number of revs to the ball
- Greatest potential to hook the ball

Obviously, the strong wrist position is for a very small segment of the population.
Components of the Release

Introduction

This is the moment of truth. Careful preparation and execution of the physical game to this point helps the athlete make a clean release of the ball. The release can best be described in terms of these three areas:

- Components of the release
- Types of release
- Troubleshooting thumb release problems

The basic components of release are introduced in the material that follows. The remaining two areas are described in detail in *Types of Release* and *Troubleshooting Thumb Release Problems* respectively, later in this chapter.

Basic Components

A proper release consists of the following three basic components:

- Thumb release
- Finger and wrist rotation
- Finger release

Even though we list these items as three separate components, they must happen in a smooth, continuous motion at the proper time.

**Thumb Release:** The first component is the thumb releasing on the downswing. At the bottom of the downswing, the thumb exits the ball just prior to the rotation of the fingers and wrist.

As the thumb relaxes on the downswing, two physical science laws, centrifugal force and gravity, come into play. The ball doesn’t fall to the ground as centrifugal force keeps the ball against the palm of the hand and gravity rests the ball on the pads of the fingers.

**Finger and Wrist Rotation:** The second part of the release involves the slight turning of the fingers and the wrist. A detailed explanation of the actual movement of the fingers and the thumb, including start and finish positions, is given in *Types of Release*, following in this chapter.

It is important to note that the action described only includes the fingers and wrist rotating and *not* the arm. The arm should remain silent and behind the ball throughout the release. This motion allows the athlete to place the proper rotation to achieve a strong rolling ball.

*Continued on next page*
Components of the Release, Continued

Basic Components continued

When the athlete rotates the hand and arm around the ball, the motion is known as “chicken winging” the ball. This is the result of an athlete trying to hook the ball and is characterized by the ball-side elbow flying out and away from the body. The end result will be the ball spinning like a top down the lane.

**Finger Release:** In the beginning stance, athletes should establish slight pressure with the pads of the fingers against the gripping edge of the finger holes. The last component of the release is when the fingers exiting the ball on the outswing energy and rotation is imparted to the ball.

Some athletes try to force the hook by turning the hand over the ball at the moment of release. It is important to maintain the same basic hand position from the moment you line up in the stance until you end up in the finish position.
Types of Release

Introduction
There are many different types of releases used by bowlers. The types of releases listed below are described in detail in the material that follows:

- Straight ball
- Basic hook ball
- Cranker release
- Full roller
- Back-up ball

Straight Ball
The straight ball release is beneficial for certain situations. For example, if the lanes are very dry and the ball is hooking a tremendous amount, your athlete probably should play straighter. A straight ball is ideal for picking up difficult spares where accuracy is critical.

To bowl a straight ball, point your thumb straight toward the ceiling, (the 12:00 position) in the stance, as shown below in Figure 7-15, Straight Ball Release. Maintain this hand position with the firm wrist throughout the approach, release and follow-through.

At the downswing the thumb exits the ball first. With the weight of the ball now resting on the pads of the fingers, the athlete will now simply release and roll the ball out and onto the lane.

Accuracy is the hallmark of a straight ball delivery. However, the percentage of strikes likely will not be high because the ball will not hook and does not hit the strike pocket at an effective angle.

Continued on next page
Types of Release, Continued

Basic Hook Ball

A contemporary analogy used to help an athlete place the hand in a position to create proper rotation to hook a ball is similar to holding a glass of water. The most important concept to understand is that the hand must stay behind the ball and not rotate around the side of the ball to create a strong rolling ball that will have the potential to hook.

**Basic Hook Release (No Finger/Wrist Rotation):** When teaching the concept of delivering a ball that will hook it may be best to first teach the athlete to preset the wrist and hand into this release position in the athletic pose.

The preset hook release position is characterized with the thumb being placed in the 10:00 to 11:00 position and the middle and the ring fingers in the 4:00 to 5:00 position in the stance. This position, as shown below in Figure 7-16, *Basic Hook Release (No Finger/Wrist Rotation)*, is maintained throughout the approach, delivery and release. In other words, the finger and wrist should not rotate during the release.

![Figure 7-16, Basic Hook Release (No Finger/Wrist Rotation)](image)

Left-handed bowlers should line up in the stance with the thumb in the 1:00 to 2:00 position and fingers at 7:00 to 8:00 position, and leave their hand in this position throughout the approach, delivery and release.

*Continued on next page*
Types of Release, Continued

Basic Hook Ball continued

**Basic Hook Release (with Finger and Wrist Rotation):** As your athletes master the feel of maintaining the 10:00/4:00 beginning hand position throughout the approach and delivery, you may introduce the concept of finger and wrist rotation.

When introducing finger and wrist rotation, the right-handed athlete will position the thumb at 1:00 and the fingers at 7:00/8:00 in the athletic pose, as shown below in *Figure 7-17, Basic Hook Release (with Finger and Wrist Rotation) – Right-handed*. The athlete maintains this hand position throughout the entire approach. As the thumb exits the ball, the wrist rotates the hand counterclockwise where the fingers release the ball in the 4:00 and 5:00 position.

![Start Position](image1)
![Finish Position](image2)

*Figure 7-17, Basic Hook Release (with Finger and Wrist Rotation) – Right-handed*

Left-handed bowlers will position the thumb at 11:00 and the fingers positioned at 5:00 and 6:00 in the stance, rotating the wrist clockwise to the 1:00 and 7:00/8:00 release position, as shown below in *Figure 7-18, Basic Hook Release (with Finger and Wrist Rotation) – Left-handed*.

![Start Position](image3)
![Finish Position](image4)

*Figure 7-18, Basic Hook Release (with Finger and Wrist Rotation) – Left-handed*

Keep in mind that this rotation takes place just as the thumb exits the ball. It should be a very quick, aggressive and smooth motion.

*Continued on next page*
Types of Release, Continued

“Cranker” Release for Greater Hook Potential

Bowlers who like to put a little more spin on the ball use a “cranker” release. Under medium to dry lane conditions, this sideways spin translates into more turn and, therefore, greater hook potential and pin action. Instruct a student who prefers this to set up in the stance with the thumb at the 2:00 position instead of the 1:00 position. Everything else remains the same. After thumb release, the wrist and fingers snap counterclockwise so the thumb will end up in the 10:00 position as shown below in Figure 7-19, “Cranker” Release.

![Figure 7-19, “Cranker” Release](image)

The full roller also is called the “suitcase delivery,” because of how the bowling ball is held in the hand throughout the stance, approach and delivery. For a right-handed bowler, the thumb is at 9:00 and the ring finger between 3:00 and 4:00. This position is maintained; there is no counterclockwise wrist and finger rotation. There would be, however, a slight clockwise rotation throughout the release.

The term “full roller” refers to how the bowling ball tracks down the lane. A full roller tracks between the finger holes and the thumbhole, over the full 27-inch circumference of the ball. This is the major reason why the full roller is an ineffective delivery in today’s game; only half of the bowling ball’s mass is turned into the pocket, resulting in poor pin carry. This is why USBC Coaching does not advocate using this release.

Correction for “hitting the thumb hole”: In some cases, you have students who hit the thumbhole (roll the ball over the thumbhole). This occurs because the hand is in between a full roller (thumb in) and three quarter (thumb out) release. To correct this, have your student make sure that the thumb is in the 1:00 position until the release. Then have them drop the thumb and rotate the fingers.

Continued on next page
Types of Release, Continued

Back-up Ball

For the most part, teach your athletes to roll the ball so that the rotation generally moves the ball toward the middle of the lane. Occasionally you encounter an athlete who delivers the ball with a rotation that moves the ball toward the channel. A characteristic of this release is that a right-handed bowler’s ball rolls toward the right channel and the left-handed bowler’s ball rolls toward the left channel.

If the athlete rotates the thumb out towards the channel during the release, the result will be a back-up ball. To change this release, a bowler must position the thumb or rotate the thumb in toward the body at the point of release, as shown below in Figure 20, Thumb Rotation to Change Back-Up Ball. This, for the most part, is not an easy change to make and is only made if the athlete wants to make the change.

![Figure 7-20, Thumb Rotation to Change Back-up Ball](image)

Since the athlete is learning a new motion, it is suggested that he or she stand at the foul line to begin the process of change. It is important that the athlete only concentrate on the new motion and how it should feel. Allowing the athlete to execute the beginning stance, approach and delivery only triggers the same customary release.

Recommended actions at the foul line include:

- Have the athlete stand at the foul line in a balanced position and concentrate on releasing the ball with the thumb pointing in toward the body.
- Use the stance at the foul line. It may further help if the athlete looks down at the hand to make sure he or she is releasing the ball in the desired hand position.

*Continued on next page*
Types of Release, Continued

**Back-up Ball continued**

- Exaggeration is a great tool to employ. Have the athlete over-rotate the thumb and hand at the point of release so the palm faces toward the body or almost down toward the floor.
- Use the one-step delivery learned in the Level 1 coaching certification material and have the athlete maintain this hand position for one step before going to full normal delivery with newly learned release.
Troubleshooting Thumb Release Problems

These three thumb release problem conditions are addressed with troubleshooting approaches in the material that follows:

- Opening/closing thumb during approach
- Opening thumb during release
- Early/late thumb release

As mentioned earlier in this chapter, the thumb is in the 1:00 position in the stance (for right-handed bowlers). Make sure your students maintain this alignment throughout the approach.

If the thumb opens during the approach (moves clockwise), the wrist will be twisted too far, opening the shoulders and wrapping the arm behind the back during the armswing. This could result in inaccuracy.

If the thumb closes during the approach (rotates counterclockwise), the hand will be in the wrong position at the time of thumb release. Reduced hook potential and pin action will result.

Although the thumb should remain in the 1:00 position throughout the approach, this is not true during the release. As we will cover shortly, the thumb does rotate counterclockwise during the release.

As you observe a student’s game, note the thumb position during the following stages of the approach:

1. Stance: Thumb in 1:00 position (11:00 position for left-handed bowlers)
2. At end of second step: Thumb in 1:00 position
3. Height of back swing: Thumb in 1:00 position
4. Step No. 4 and slide: Thumb in 1:00 position
5. Finish position (after thumb release): Thumb in 10:00 position (2:00 position for left-handed bowlers)

Continued on next page
Troubleshooting Thumb Release Problems, Continued

Opening Thumb During Release

Some bowlers unintentionally rotate the bowling ball in a clockwise instead of a counterclockwise position. We refer to this as opening the thumb. If the thumb opens during the release, a reverse sideways spin is imparted to the ball. In other words, the bowling ball will tend to hook to the outside instead of moving to the inside. This is called a back-up ball. Often, the bowling ball misses the head pin, resulting in poor pin carry.

Early/Late Thumb Release

Two common problems bowlers experience are dropping the thumb out of the ball too early or leaving it in the ball too long. As we covered earlier, the thumb should release at the point where the ball passes the slide leg on the last step.

If the thumb release occurs too early, the ball will drop too early, either just before or at the foul line. It is impossible to loft or impart sideways spin to create hook potential during the release if the thumb drops out too early.

If the thumb releases from the bowling ball too late, finger and wrist rotation isn’t translated into hook potential. In addition, if the thumb hangs up in the bowling ball, it will be released at an improper angle. Inaccuracy will result.

There are five common reasons why the bowling ball may be released too early or too late. As a coach, study your athlete’s releases to detect problems and engineer effective solutions. Common problems are listed below.

- **Thumb hole of bowling ball too large or too small**: If the thumb hole of the ball is too large, there is a tendency for the thumb to drop out too early. If the hole is too small, the thumb hangs up in the ball, resulting in late thumb release.

- **Fear of dropping the ball**: Some athletes fear that if they pull the thumb out of the ball at the end of the fourth step, the ball will immediately fall out of their hand. Emphasize to your students that the forward momentum of the ball keeps it moving forward. In addition, the centrifugal force generated in the armswing will keep the ball firmly against the hand until the point of finger release.

- **Timing**: If the armswing is not timed properly with the feet movement, the thumb release will not occur at the appropriate time. Check timing for your athletes throughout the approach.

*Continued on next page*
Troubleshooting Thumb Release Problems, Continued

**Early/Late Thumb Release continued**

- **Tempo**: The approach should be performed in an aggressive manner. If a bowler has a slow approach and armswing, the bowling ball can drop from the hand too soon after the thumb release. Loft and sideways spin are affected as a result.

- **Habit**: Some bowlers have a habit of hanging on to the bowling ball too long, reasoning that they need to put something extra into it. We cover helping your athletes overcome this problem in 3 – *Timing,* later in this chapter.
The Finish Position

**Follow-through**

Why is paying attention to the finish position so important? After all, the ball has already been released and is on its way down the lane. There is nothing more that a bowler can do to influence the outcome.

The finish position will give you insight on how the ball was delivered. A solid finish position allows the athlete an opportunity to have a good follow through.

Why is following through important? Think about throwing a football. If a quarterback’s hand stopped at the moment the football were released, speed, distance and accuracy would be sacrificed. If a tennis player stopped the arm an instant after connecting, the tennis ball probably wouldn’t clear the net. A correct follow through and finish position helps you maintain accuracy, body balance and consistent success.

The finish position should be evaluated both from the side and back view positions, and includes the following components of the slide and the follow-through:

- The slide – waist down
- Overall position from side
- Overall position from back
- Follow through – waist up

*Continued on next page*
The Finish Position, Continued

The Slide (Waist Down)

At the end of the last step, the non-ball side foot plants for the slide. At the same time, the ball-side foot should move sideways behind the body as shown below in Figure 7-21, The Slide.

Moving the ball-side foot to the outside of the slide foot accomplishes several positive things:

- It helps opens the hip to allow more clearance for the bowling ball as it moves past.
- Creates a path or a hole that armswing will fill when delivering the ball.
- Armswing has an opportunity to be close to the slide foot creating a strong leverage position.
- It provides a counter balance or action to all the motion that must occur on the ball-side of the body.
- It shifts the weight of the body toward the side opposite the bowling ball for better balance.

The ball side leg must move out of the way early enough to create a path for the ball to be delivered close to the slide foot ankle. If the ball side leg does not get out of the way, the armswing will naturally move into a direction around the leg to prevent the ball from hitting the leg.

It is recommended that an athlete hold their finish position or “post the shot” until the ball hits the pins. If the shot was delivered properly your athlete will have no problem maintaining this balanced posture.

Continued on next page
The Finish Position, Continued

The Slide (Waist Down) Continued

Staying low with good knee bend during the last step of the delivery will promote better ball delivery and balance. Flexing the knees a little more and lowering the body during the slide prevents the athlete from prematurely rising out of the finish position. The athlete should hold his or her balanced finish position until the ball hits the pins.

Additionally, the ball-side foot must stay near the ground to help keep the athlete’s shoulder in a natural athletic tilt. If this foot comes off the ground, there is a tendency for the athlete’s shoulders to fall forward.

Overall Finish Position – Side View

In a side view of the perfect finish position, as shown below in Figure 7-22, Finish Position – Side View, the chin, knee and toe are aligned in a straight line perpendicular to the floor.

![Figure 7-22, Finish Position – Side View](image)

In this position, notice that:

- The arm has continued arcing upward after ball release.
- The angle of the spine is the same as it was in the stance.
- The knees have flexed further to complement a better delivery of the ball onto the lane.

Continued on next page
The Finish Position, Continued

Overall Finish Position – Back View

The back view of the perfect finish position is shown below in Figure 7-23, Finish Position – Back View.

For a right-handed bowler, the right arm ends up at approximately the 1:00 position, with the left leg at 6:00, the right leg at 7:00 and the head at 12:00.

For a left-handed bowler, the left arm ends up at approximately the 11:00 position, with the right leg at 6:00, the left leg at 5:00 and the head at 12:00.

Continued on next page
The Finish Position, Continued

The Follow through (Waist Up)

As discussed above regarding the slide, the body needs to stay low on the final step. To obtain a strong, leveraged delivery position, the shoulder must maintain a natural athletic tilt established in the stance. With the shoulders in this position, the athlete can release the ball on to the lane. The body requires getting close to the ground, as shown below in Figure 7-24, Follow Through, by bending the non ball-side knee and not bending over at the waist – which increases the shoulder tilt.

A good follow through is a byproduct of a natural armswing. As discussed in Armswing earlier in this section, it is important to allow the arm and the ball to swing from the shoulder.

The second an athlete tightens muscles in the arm and tries to control any aspect of the armswing, the result is to slow the natural speed and motion of the arm. If the arm is allowed to swing freely, the motion will appear almost effortless. The follow-through is a natural extension of this process and includes these characteristics:

- Ball rolls off the pads of the fingers
- Hand remains behind the ball
- Arm remains in the swing plane aligned with the target line
- Loose arm continues to arc toward the ceiling and back down

Figure 7-24, Follow Through
A Final Word About the Physical Game

The Approach and the Coach’s Eye

Analyzing your athletes’ games is one key job you perform as a coach. Correct evaluation of the strengths and weaknesses of each of your athletes is a prerequisite to engineering a change. In order to properly perform these evaluations, you must develop your coach’s eye.

Remember: The No. 1 factor to look for is consistency. Although individual styles vary from bowler to bowler, there should be little variance in the style of each bowler’s game (unless the variance is an intentional adjustment made to compensate for prevailing conditions).

Videotaping: USBC Coaching strongly recommends the use of videotaping equipment to help you perform this job. (See CHAPTER 9 – COACHING AIDS.) Inconsistencies may be rapidly noted, documented and shown to the student. From this information, you can assist your athletes in engineering a game that complements their body make-up and individual style.

Here’s what to look for:

- Look first at the stance and make sure bowling ball placement and body positions are consistent.
- Note that the ball start is the same distance down and out every time.
- Check the armswing from the back and side views, looking for wrapping the arm in or out.
- Note the thumb position, making sure the thumb neither opens nor closes.
- View body positions after each step, noting correct positioning of every body part as well as overall balance.
- Carefully scrutinize the height of the back swing. Remember: A variance of eight inches translates to a timing variance of 16 inches (eight inches up for the back swing and eight inches down for the delivery swing).
- Check the thumb position at release, finger/wrist rotation, finger release and loft. Again, the principal factor you should look for is consistency and repeatability.

Continued on next page
A Final Word About the Physical Game, Continued

The Approach and the Coach's Eye

Overcompensation: As a rule of thumb, within 90 days after a change has been successfully engineered, a student begins overcompensating. Be prepared for this and explain what is happening to your student when you notice this trend. Make fine tuning adjustments in the opposite direction to get him or her back on target. The engineering process is a perpetual one, although the adjustments should keep getting finer and finer as a bowler moves closer to his or her optimum game.

Checking Balance Throughout the Approach

Balance is critical to a proper approach. If a bowler becomes unbalanced, several things happen. First, the bowler tends to drift to the right or left during the approach. Second, the armswing is affected, causing the arm to wrap in or out. The net effect is that the laydown point and angle of delivery varies, which means inaccurate, inconsistent bowling.

Proper balance begins in the stance. Make sure your students are properly poised and the center of gravity of their bodies is tilted slightly forward, promoting proper potential for forward momentum while maintaining control.

Notice the ball start next. If a bowler pushes the ball too far forward instead of down, the center of gravity is shifted too far forward, resulting in improper timing.

On each step of the approach, check body positions, including the non-bowling arm. Remember: body positions in the book are suggestions to provide optimum body balance. Only if all of the parts of the body work in unison will this balance be realized.

The fourth step is probably the area where most bowlers get off balance. Make sure the knees bend properly so the body does not bend over to the side during delivery. Note the slide of the left foot (right foot for left-hand bowlers). Ascertain if the center of gravity shifts to the left during the slide to compensate for the weight of the bowling ball during the delivery.

Finally, note the finish position. Has the student followed through properly? Is the bowler balanced and poised, or is he or she wobbly and unbalanced? Improper balance at the finish position is often an indication of other problems in the approach, release and follow-through.

When a student attains proper balance throughout the approach and delivery, accuracy and fluid motion naturally result.
Section 3 – Timing

Overview

Introduction

Now that we have identified all working parts of the physical game and understand the role of each, we are ready to put everything together and create the motion.

We have heard the statement, “Timing is everything!” In the sport of bowling, there is no truer statement. Developing proper timing is the crucial component of your athlete’s game. Improper timing affects almost every aspect of the physical game.

This section defines the concepts regarding why timing is so important, identifies different types of timing and gives helpful hints to engineer solutions for timing problems.

In this Section

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Description and Importance of Timing

Description
What is timing and why is it so important?

Timing is the relationship of the location of the ball to the steps that an athlete takes during the approach and delivery. Even though an athlete may fall into a general timing type, an athlete’s physical abilities will create his or her own uniqueness within that type when getting to the foul line.

Essentially timing is coordinating the movement of the body and the ball throughout the approach and delivery. It is critical that the body and ball move in concert with one another.

Importance
Keep in mind that the bowling ball is a heavy object that has an increased affect on the body when in motion. If the body and ball are out of sync with each other, the ball adversely affects the natural movement of the body. Additionally the ball in motion creates torque against the body, making it work very hard to deliver the ball.

As stated earlier, the body is a magnificent machine. The body has reflexes that are designed to protect it from harm when it senses imminent danger. When the ball is out of sync with the body, the body goes into “survival mode,” where it does its absolute best to avoid injury when delivering the ball.

Although each athlete has his or her own style and interpretation of how they wish to deliver the ball, the coach’s job is to develop the timing that optimizes the athlete’s game based on physical ability. A mismatch or improper timing will hamper the athlete’s ability to compete and may result in physical discomfort.
Concepts and Types of Timing

The Concept

Timing is not an exact science. Primarily, the objective is to get the body to the foul line in front of the ball.

These timing concepts are described in the material that follows:

- Perfect timing
- Basis for timing
- Timing reference

Perfect Timing

The diagrams or illustrations for perfect timing may be found in the same place where a coach finds the blueprint for the perfect bowler. Perfect or proper timing lives within each athlete and is as different as each athlete.

A coach must assess each athlete. Development of the physical game includes finding the proper movement of the ball and body that allows the athlete’s motion to remain fluid and smooth, ending in a strong, balanced and leveraged finish position. This process is different for each athlete and represents his or her version of “perfect timing.”

Be careful as you work with your athletes to not get caught into the trap of identifying particular relationships of body and ball as being good or bad timing. What you may identify as bad timing for one athlete may be exactly right for another. Conversely, categorizing a motion as good timing may create problems for an athlete.

Your job is to develop “personal timing” that properly matches and maximizes the ability of each of your athletes.

Basis for Timing

Timing for the most part is identified with four movements of the arm that easily correspond to the steps taken in the classic four-step delivery.

Proper timing is generally judged by the ball/step relationship shown in the illustrations that follow. Remember, each athlete has different body types and abilities and no one is perfect. These illustrations serve as guidelines and are not considered absolutes.

Continued on next page
Concepts and Types of Timing, Continued

Basis for Timing continued

Coaches identify timing by referencing where the ball is located in relation a step. A numeric representation for timing always identifies the location of the ball first followed by the step. A colon (:) separates these two values. An example that identifies a ball being in the second step position on the second step would be: 2:2

The illustrations that follow depict the basis of timing and are representative of where the ball and foot would ideally be positioned for an athlete who would be classified as a stroker.

**Stance to completion of Step One:** The Athletic pose would represent timing 0:0 (below left illustration). The completion of the first step shows arm extension at the conclusion of the ball start, with a short step taken with ball-side foot, as shown below in *Figure 7-25, Stance to Step 1*. The illustration on the right represents the completion of the first step and 1:1 timing.

![Figure 7-25, Stance to Step 1](image)

*Continued on next page*
Concepts and Types of Timing, Continued

Basis for Timing continued

**Step Two:** Ball is by ball-side leg at the end of this step, as shown below in Figure 7-26, Step 2. This figure represents 2:2 timing.

![Figure 7-26, Step 2](image)

**Step Three:** The ball reaches the height of the back swing at the end of this step, as shown below in Figure 7-27, Step Three. This figure represents 3:3 timing.

![Figure 7-27, Step Three](image)

Continued on next page
Concepts and Types of Timing, Continued

Step Four: Ball is delivered near the slide foot side ankle, as shown below in Figure 7-28, Step 4. This figure represents 4:4 timing.

![Figure 7-28, Step 4](image)

A coach must see the entire picture before making any changes. Adjustments to an athlete’s game should not create new problems or eliminate the strengths and assets of his or her game. You want to build on what the athlete is doing well, as opposed to reinventing the wheel.

Timing Reference

Often you hear the statement that an athlete has early or late timing. Understanding that timing covers the relationship “ball to steps” throughout the entire approach and delivery, a coach should be specific as to the step where the problem exists. A coach should not make the assumption that an athlete who starts with early timing will always finish with that same early timing.

A lot of things can and usually happen from the initial ball start to the finish position. Using the above example where an athlete’s early ball start has created early timing in the first step of the four-step delivery (2:1). The athlete’s arm continues it free movement where the ball reaches the height of the backswing at the end of the second step (3:2). During the entire 3\text{rd} step the athlete is able to suspend the ball at the top of the backswing (3:3). The athlete continues to suspend the ball and starts the downswing with the slide foot more than half way through the last step, creating late timing at the point of release. Making the statement that this bowler has early timing would be incorrect for the 3\text{rd} and 4\text{th} step.

Continued on next page
Concepts and Types of Timing, Continued

Timing Reference continued

Study and watch the athlete’s entire motion from start to finish. Before making any changes determine the assets or strengths. Then decide how to eliminate the liabilities without disturbing the assets of the athlete’s game.

Types of Timing

There are three types of timing:

- Early
- Late
- Stroker

**Early Timing:** Early timing, as shown below in Figure 7-29, Early Timing, refers to the ball being ahead of the steps for the classic four-step delivery. The ball will arrive ahead of the slide foot and body at the foul line. The ball usually ends up inside the target or toward the middle of the lane.

![Figure 7-29, Early Timing](image)

*Continued on next page*
Concepts and Types of Timing, Continued

**Types of Timing continued**

**Late Timing:** Late timing refers to the ball being behind the steps for the classic four-step delivery. The ball will arrive well after the slide foot and body at the foul line. The ball usually ends up outside the target, or toward the channel.

![Figure 7-30, Late Timing](image)

**Stroker Timing:** Stroker timing refers to the ball being in time with the steps for the classic four-step delivery. The ball arrives slightly after the slide foot comes to a stop at the foul line. The ball usually ends up hitting the desired target.
Engineering Solutions for Timing Problems

Locating Problem Areas

The relationship of the body parts to one another during each step of the approach is a matter of timing. As your athletes bowl, check these positions during every step.

It may be helpful to videotape your students as they bowl. Then, freeze the frames after each step. Not only will this help you, it also helps your student accurately visualize how they look when they bowl, locate problem areas and see where they should make adjustments.

If true items of concern problems are noted, adjustments are necessary to put a bowler in proper time. As discussed, timing is basically coordinating the armswing to the movement of the feet. When working with an athlete it is important to remember that there is no such thing as good or bad timing.

Timing will vary with each athlete and will be unique to that athlete. When working on an athlete’s timing a coach is looking to develop proper timing to maximize an athlete’s game. For example, late timing is not bad as it must be present to generate leverage for certain type of athletes.

If a bowler consistently drops the bowling ball too early or hangs on to it too long, the problem may be the fit of the bowling ball instead of timing. Check to be sure the finger and thumbholes are the proper size. See CHAPTER 6 – BOWLING BALL PARTS AND DYNAMICS for more information regarding proper fit.

Slow Armswing

The most common timing-related problem is a slow armswing.

Inexperienced bowlers tend to be deliberate in their armswing. Often, when they are told to pick up the tempo, they do so by speeding up their feet movement. This puts them even further out of time.

Correct this problem by speeding up the armswing, not slowing down the feet. Tempo and ball velocity are sacrificed if you slow down the feet movement, and you want to encourage your students to bowl a quick, aggressive game.

Remember: Put your students in proper time by adjusting the armswing to the feet movements. The feet usually follow the swing.

Continued on next page
Engineering Solutions for Timing Problems, Continued

Adjusting the Armswing Length

In addition to speeding up the armswing, you can also adjust the position of the bowling arm in the stance to advance or retard the armswing in relation to the feet.

Starting the ball from a higher position means the bowling arm has to travel a bit further as opposed to lowering the ball start position, which will reduce the distance the arm travels. Adjusting the height of the backswing is another area where a coach can look to alter the approach to fine tune the athlete’s timing.

Finding “proper timing” that matches the natural cadence or inner drumbeat of an athlete is like adjusting the air/fuel mixture of a carburetor to allow an engine to run at an optimal level.
Chapter Summary

Following are key points presented in this chapter.

1. The rule is, “there is no rule.” When matching individual styles and abilities to the components of the physical game a coach should not clone, cookie cut or boiler plate all athletes to bowl exactly the same. There is no magic one size fits all solution.

2. Until the body has had sufficient opportunity to learn and replace an old motion with the new motion, there will always be that chance, particularly under pressure, that the body will revert back to its old and familiar motion. It takes more than 1500 repetitions before a new habit becomes second nature.

3. Components of the physical game include:
   - Ball Start
   - Tempo
   - Armswing
   - Wrist position
   - Release
   - Finish position

4. Items of concern regarding the Ball Start include:
   - Length of Ball Start
   - Force exerted
   - Vertical movement

5. To achieve this ball speed, a fast tempo is necessary during the approach. Encourage your athletes to use a fast, aggressive game.

6. The overall tempo of the athlete needs to be fairly aggressive since this motion will translate to energy that is imparted to the ball.

7. The arm must be allowed to swing freely from the shoulder. Muscling will initially retard the natural motion as the arm and shoulder tighten up. It will be very difficult to reproduce the same motion with the body when the athlete constantly muscles each shot. The inability to reproduce the same exact motion means a reduction of accuracy because each shot will be different.

Continued on next page
8. The movement of the ball outside of the swing plane will cause an athlete to drift during their approach to the foul line.

9. When analyzing the arm swing, the coach should use two different vantage points: the back view and the side view.

10. There are three basic types of swings as you view your athlete from the side:
   - Roller swing
   - Stroker swing
   - Cranker swing

11. There are three basic types of wrist positions that an athlete may employ:
   - Firm
   - Relaxed
   - Strong

12. Wrist positions directly affect the location of the fingers to the bowling ball at the point of release. A reference point used to identify where the fingers are in the ball, is “the equator of the ball.” The longer the fingers stay in the ball after the thumb is released, the greater the ability to impart energy to the ball.

13. A proper release consists of the following three basic components:
   - Thumb release
   - Finger and wrist rotation
   - Finger release

14. The different types of releases introduced include:
   - Straight ball
   - Basic hook ball
   - Cranker release
   - Full roller
   - Back-up ball
Chapter Summary, Continued

Key Points to Remember continued

15. Early or late thumb release may be attributed to issues with timing, equipment, tempo and habit.

16. In the finish position the coach should observe the overall posture of the body from both the side and back view. Items to pay attention to include:
   - Follow through
   - Position of balance arm
   - Position of ball side foot
   - Position of shoulders
   - Alignment of the chin, knee and toe

17. Timing is the relationship of the location of the ball to the steps that an athlete takes during their approach and delivery. Improper timing will affect almost every aspect of the physical game.

18. The diagrams or illustrations for perfect timing may be found in the same place where a coach finds the blueprint for the perfect bowler. Perfect or proper timing lives within each athlete and is as different as each athlete.

19. When working with an athlete a coach should never qualify early or late timing as being good or bad as there is no such thing as good or bad timing. Developing “proper timing” is the focus of a coach.

20. Timing is defined in terms of ball position to foot position. Sample numeric representation of timing include:
   - Early – 2:1, 3:2, 4:3
   - Stroker – 1:1, 2:2, 3:3, 4:4
   - Late – 1:2, 2:3, 3:4

21. When working on timing problems, adjustments are always made to the armswing to match the foot movement, as the feet will always follow the swing.