CHAPTER
12 part II
FUNDAMENTAL CONCEPTS
59 Slides

Dr. Jim Solum
© Copyright 2011
12. FUNDAMENTAL CONCEPTS

6. COCKING AND ACCELERATION

Throwing motion 2 parts:

1. Cocking
2. Acceleration.

Shooter cocks the ball and accelerates the ball.
12. FUNDAMENTAL CONCEPTS

6. COCKING AND ACCELERATION

1. Whole body cocks the ball.

2. Whole body accelerates forward to shot.
6. COCKING

The ball is cocked like the archer’s arrow.

Shooter’s body is angled & cocked like an archer’s.
6. COCKING

1. Right arm cocked back
2. Torso turns right
3. Hips rotate right
4. Right leg steps-back
12. FUNDAMENTAL CONCEPTS

6. ACCELERATION

Shooter’s whole body accelerates forward to shoot:

Legs,

Hips,

Torso,

Right arm.
12. FUNDAMENTAL CONCEPTS

6. ACCELERATION

Faster shooter’s whole body accelerates, the faster the shot and quicker the release.
12. CONCEPTS

6. COCKING & ACCELERATION MYTHS & MISTAKES

1. Right arm only cocks the ball.
   False

2. Shot thrown solely by right arm.
   False

3. Hips do not cock the right arm.
   False
12. CONCEPTS

6. COCKING & ACCELERATION
   MYTHS & MISTAKES

3. Shooter’s body should move slowly.
   False

4. Slow body speed = quick shot.
   False

5. Slow hip motion = power shot.
   False
12. FUNDAMENTAL CONCEPTS

6. Archery and the Water Polo Example

The archer pulls back the bowstring to cock arrow.

1. Angles the body. Cannot cock bow if square.

2. Left foot forward, right leg back, rotates the hips and pulls back the right arm to release the arrow.
The archer never has:

- Square feet
- Falls over
- Drops the elbow
- Falls to side

...to release the arrow.

The archer is vertical and angled.
12. FUNDAMENTAL CONCEPTS

7. THE WHIP
The body is a whip. A chain of body links.
Four links of the body throw the ball:

1. Legs
2. Hips
3. Torso
4. Arms
12. FUNDAMENTAL CONCEPTS

7. THE BODY IS A WHIP

Power transfers upward link-by-link from base of the whip, the legs, to the tip—the right arm.

Whip Base: Legs
Whip Middle: Hips, Torso
Whip Tip: Right Arm
12. FUNDAMENTAL CONCEPTS

7. THE BODY IS A WHIP

Power increases upward from legs to arm.
Power accelerates up the chain from the legs to hips, to torso and up into right arm.

A Chain-Reaction Shot.
12. FUNDAMENTAL CONCEPTS

7. THE BODY IS A WHIP

Power increases upward from legs to arm. From the big muscles (legs) to the small muscles (right arm).

It is a Chain-Reaction Shot.
12. FUNDAMENTAL CONCEPTS

8. VERTICALITY AND ELEVATION

Shooter must be vertical to rotate the hips.
The shooter must be vertical to elevate.
12. FUNDAMENTAL CONCEPTS

8. VERTICALITY AND ELEVATION

When the shooter is vertical and high out of the shooter is powerful and accurate.
8. VERTICALITY & ELEVATION

Legs keep the back vertical and elevate the shooter.

The No. 1 & 2 problems.

No one can score lying-on-the-back or underwater.
12. FUNDAMENTAL CONCEPTS

9. THE SPIN IS SUPREME

Backspin is the universal spin. Ball spins backward.

Stripes are vertical on the correctly thrown ball.
12. FUNDAMENTAL CONCEPTS

9. THE SPIN IS SUPREME

The end result of perfect throwing mechanics is a ball with a perfect spin.
12. FUNDAMENTAL CONCEPTS

9. THE SPIN IS SUPREME

The spin on the ball is critical to the shot.

Few have thought about ball spin. In baseball and softball the spin is everything to the pitcher.
12. FUNDAMENTAL CONCEPTS

9. SPIN CONTINUED

The proper ball spin is the backspin.

Ball spins backwards with vertical stripes.
12. FUNDAMENTAL CONCEPTS

9. SPIN CONTINUED

There is one basic spin: the back spin.

The topspin is an advanced ball spin.

Defects in ball spin cause the ball to dive, to rise, curve right or curve left.
12. FUNDAMENTAL CONCEPTS

9. BALL SPIN DEFECTS

No Spin        Ball lifts up
Side Spin      Ball curves left
Diagonal Spin Right Ball curves right
Diagonal Spin Left Ball curves left
TWO MAJOR SPINS

BACKSPIN

BACKWARD ROTATING BALL SPIN

FORWARD ROTATING BALL SPIN

TOPSPIN
12. FUNDAMENTAL CONCEPTS

9. SPIN FINGERTIP MISTAKES

Ball Veers to Right

Index finger presses on ball.

Ball Veers to Left

Ring finger presses on ball.
Square with dropped elbow.
12. FUNDAMENTAL CONCEPTS

9. SPIN THROWING MISTAKES

Prevent improper spin with a high elbow.
Fingertips apply equal pressure on the ball.
12. FUNDAMENTAL CONCEPTS

9. SPIN THROWING MISTAKES

When the Elbow Drops:

Ball lifts up due to a horizontal hand.
Ball curves to left. Hand turns inward.
Unequal finger pressure moves the ball right or left.

Index Finger: BALL RIGHT

Ring Finger: BALL LEFT
12. FUNDAMENTAL CONCEPTS

INDEX FINGER MOVES BALL RIGHT
12. FUNDAMENTAL CONCEPTS

RING FINGER MOVES BALL TO LEFT
12. FUNDAMENTAL CONCEPTS

9. SPIN AWARENESS DRILL

Drill:

Players pass the ball watching the angle of the ball stripes. Stripes are vertical.

No horizontal or diagonal ball stripes.
12. FUNDAMENTAL CONCEPTS

9. SPIN AWARENESS DRILL

FACT

95-percent of the players have never thrown a good pass with the ball stripes vertical.
12. FUNDAMENTAL CONCEPTS

9. SPIN AWARENESS DRILL

FACT

A black line appears down the middle of the spinning ball on a good pass.
12. FUNDAMENTAL CONCEPTS

10. COUNTERMOTION

Countermotion: Imperfections in throwing motion

Throwing defects cause:

1. Lost of ball speed
2. Ball rises or curves
3. Loss of accuracy
10. COUNTERMOTION

Countermotion is a backward or sideways body motion that alters the throwing motion.

Countermotion has a drastic effect on the shot.
12. FUNDAMENTAL CONCEPTS

10. COUNTERMOTION

Four countermotions destroy the shot:

1. Square
2. Falling on Back
3. Falling on Side
4. Dragging Elbow
12. FUNDAMENTAL CONCEPTS

10. FOUR COUNTERMOTIONS

1. Square-to-the-goal
2. Falling-on-the-back
3. Dragging-the-elbow
4. Falling-on-the-side
12. FUNDAMENTAL CONCEPTS

10. 1st COUNTERMOTION

1. Square-To-The-Goal

Shooter has feet, hips and shoulders square-to-goal.
10. 1st COUNTERMOTION

1. Square-To-The-Goal

Square shooter cannot cock right arm and body and throws a weak shot.

Fix: Point Left foot
10. 2nd COUNTERMOTION

2. Falling-On-The-Back

Square shooter falls over and throws a weak shot.
12. FUNDAMENTAL CONCEPTS

COUNTERMOTION

2. Falling-On-The-Back

Fix:
Kick the legs hard to keep back vertical.
12. FUNDAMENTAL CONCEPTS

10. 3rd COUNTERMOTION: DRAGGING-THE-ELBOW

Shooter drags elbow in water when faking and shooting. Low Release Point = Low Corner Shot = Block.

LOW ELBOW SETS UP BLOCK
12. FUNDAMENTAL CONCEPTS

10. 3rd COUNTERMOTION: DRAGGING-THE-ELBOW

Fix: Lift up the arm, kick harder.

LOW ELBOW SETS UP BLOCK
10. 4th COUNTERMOTION

4. Falling-On-The-Side

Shooter falls on the side while shooting.

Girls fall over on a cross-cage shot to left corner.
12. FUNDAMENTAL CONCEPTS

10. Falling-On-Side Correction

Fix: Point left foot at left corner.
THE FUNDAMENTALS:
THE LEGS ARE THE SHOT
NO LEGS, NO SHOT
LEFT

RIGHT

ROTATE

Point Left Foot, Right Leg Back, Rotate Hips
12. FUNDAMENTAL CONCEPTS

**SUMMARY**

1. The shooter’s whole body throws the ball.
2. Legs provide aim, accuracy, verticality & velocity.
3. Shot starts in the toes and ends in the fingertips.
4. Shooter has the left foot forward to point and pivot and the right leg straight back for balance.
12. FUNDAMENTAL CONCEPTS Q & A

1. The right arm puts spin on the ball.
   True
   False

2. The whole body throws the ball.
   True
   False

3. The hips are critical to throwing.
   True
   False
12. FUNDAMENTAL CONCEPTS Q & A

4. The left foot aims the ball.
   True
   False

5. The right hand aims the ball.
   True
   False
12. FUNDAMENTAL CONCEPTS Q & A

6. Only the right arm throws the ball.
   True
   False

7. The right leg rotates back to make the left shoulder point.
   True
   False
12. FUNDAMENTAL CONCEPTS Q & A

8. A square body has the feet, hips and shoulders parallel the goal.
   True
   False

9. Rotation is unimportant.
   True
   False
10. Body rotates around the left foot pivot.
   True
   False

11. The legs and hips throw the ball.
   True
   False
12. The left hand is unimportant for shooting.
   True
   False

13. Catching and cocking are unimportant compared to throwing the ball.
   True
   False
12 FUNDAMENTAL CONCEPTS Q & A

Answers to the Science of Shooting PowerPoint Chapter 12 Part II.

1F  2T  3T  4T  5F  6F  7T  8T  9F  10T  11T  12F  13F
END
CHAPTER
12
Part II