

The High School Discus Thrower

Marvin Estes, Kapaun Mt. Carmel High School, Wichita, Kansas: Marvin Estes, 703 North
Prairie Dunes, Wichita, Kansas 67230 – 620-222-8287 estes.marvin@gmail.com

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Esperanza High School

Developing a skilled top level discus thrower requires patience but has many rewards. To begin with, the discus is an event that requires a high level of skill. Unlike the sprints or jumps, a decent thrower is almost never beaten by a superior athlete who walks over and dabbles in the event. By becoming technically proficient a thrower of very modest athletic ability will defeat the great majority of his competitors, and a truly gifted athlete will dominate most meets short of the prestigious invitationals. In discussing the training of the discus thrower, I will emphasize coaching approaches and experiences I have found in developing high school throwers. I will discuss everything in terms of a right-handed thrower. reverse all directions for a left hander. Also, in describing the ring, I will refer to the rear where the throw begins as 12 o'clock with the front being 6 o'clock etc. Developing a top level thrower has many stages:

1. Selection of athletes

For most throwing coaches cutting athletes is never a requirement, so the real question is to whom do I devote the greatest coaching effort. If the coach only has one or two athletes, this is simple, but with 5 or more throwers, the coach needs to try and spot aptitude early and nurture it. Ideally a discus thrower is gifted with athletic ability which may be evident as they excel in other sports. Height is also of great benefit. Height provides two indispensable qualities. First, long arms provide long levers. If two discus throwers are rotating at the same speed, the farther the discus is from the body (or axis) the greater the momentum generated. Secondly, a taller thrower has a higher release point if he/she throws correctly. Three factors determine the distance a discus will travel.

- 1) Velocity of discus at release
- 2) Angle of release
- 3) Height of release point.

A 6' tall thrower throwing a discus on the exact same flight path (parabola) as a 5' 9 thrower will throw farther since his flight path starts higher and reaches the ground later. Yet, since few of us are gifted with tall and skilled athletes, the best bet initially is the well coordinated athlete while the taller thrower represents longer range potential.

2. Introducing the discus

Ideally the training of the thrower can begin in the fall. However, if the thrower needs to begin in the spring following a winter sport, the same training principles apply. The most important factor with beginners is to devote enough time to them so that they are fundamentally sound. It is very difficult to take a thrower who has been throwing with major flaws such as diving out of the back and correct them.

It takes less time overall to start them correctly. First, a thrower must walk correctly before he can run. In other words, he must know how to grip and release the discus correctly before he takes standing throws. Then, he must master the standing throw before he throws from a pivot on the right foot. Finally, he must pivot correctly before he takes complete throws. All beginning throwers see older throwers and want to attempt full throws, but when they begin these on their own, they develop and cement flaws which some throwers never lose. The beginner may either spread his fingers or place the index and middle finger together with the joint of the first knuckle on the outside edge of the discus. Most beginners will release the discus out the back of their hand. Have two beginners stand 5 yards apart and "bowl" the discus back and forth. **(emphasis should be placed on allowing the discus to "roll" out of the hand being touched last by the index finger on the throwing hand regardless of the spread fingers or double middle/index finger grip)** This teaches them to release the discus correctly, If they do not release it vertically, it will roll off to the side. They attempt to roll it straight to each other so that the receiving partner does not have to move sideways to pick up the discus. Once they can roll it 10 times back and forth with no one moving, they proceed to "skimming" the discus. **(an intermediate step might be to have the beginner who has mastered the bowling drill, gradually move the discus away from the throwing side hip to ever higher positions on that side until they can throw the "skimmer" position at shoulder level – it is often difficult for beginners to "control" the discus moving abruptly from the bowling drills to the skimmer drills)** This also can involve partners. They stand 20 yards apart and release the discus horizontally working on level flight. They should understand that the faster a discus rotates, the farther it will travel, so a good release is vital.

3. The "Standing Throw"

In teaching the discus we break the throw into four parts.

- 1). Swinging the right leg outside the ring at the rear of the ring as the throw begins over the left foot
- 2). Driving out of the back and landing on the right foot in the center of the ring
- 3). Pivoting on the right foot until the left foot touches in the "power position"
- 4). Throwing from the "power" position.

The teaching progression takes these 4 parts and works backwards. Show the beginner what a full throw looks like and explain that we will master the final step and then work backwards one step at a time. Standing throws should not only provide a warm up but they should emphasize technique that will improve the full throw not just the standing throw. **(emphasis should be placed on the correct position of critical body parts in the power & delivery positions)** For example, excessive lunging forward during the throw will add distance to the standing throw but detract from the full throw. **(resist the temptation of beginners to throw hard in these positions – they must understand that their task is to find and feel the correct positions of critical body parts in the power position & the delivery positions – we start our throwers with standing throws either with elastic cord or with a towel held by a coach or fellow thrower so that they must check foot position, left arm position, right hip position, right foot position, knee (R & L), and head position – most beginners will have to learn to throw on their toes and not on their heels – these positions should be taught before going on to the more advanced step through drills described next in this article – again, each beginning thrower should be able to demonstrate these positions each day prior to continuing the work out – corrected repetition eliminates deadly bad habits later as the progressive throwing phases are added)** The type of standing throw I prefer is seen on the Mac Wilkins instructional video. The thrower faces the back of the ring with the right foot in the center. The left leg is extended so that a vertical line can be drawn from the thrower's head to his left foot. The weight is centered on the right foot. To begin, the thrower holds the discus in front of him and swings it a little to his left and then draws it back keeping the right arm at full extension until the discus points up at the same angle it will be finally released on at the finish of the throw. **(again, this position must be correctly taught to prevent time consuming correction later after the athlete has programmed his/her muscle memory)** The left arm stays extended in front of the body **(the re-wrap position)**. The left arm needs to stay extended as a counterbalance to the extended right arm. **As the right arm reaches as far back as it can, the thrower shoots the left foot through to the middle – as the left leg shoots to the middle, the left knee opens and begins the rotation of the right hip in front**

of the right shoulder and discus). This foot touch simulates what happens in the real throw as the left foot reaches the "power" position. This touch **(with the rotation of the left knee opening)** initiates the throw. **(we have found that the opening of the left knee makes the transition from the power position to the delivery position smoother, faster, and more effective by transferring the momentum gained in the back of the ring into the final velocity of the discus)**

The right foot pivots on the ball of the foot as the right arm pulls in a long "U" shaped path down to a low point behind the thrower and back up to a release as near shoulder height as possible. **(this is caused by the axis along the left foot through the top of the head – it is at an angle and causes the “dipping” of the discus described above as the “U” shaped path – the two axes theory??)** The right foot stays on the ball of the foot as it pivots. Ideally, the right arm will stay as near as perpendicular to the body as possible as it sweeps around the body. The left arm will also be extended as it sweeps from 12 o'clock to 6 o'clock with the thumb pointing at the body. Once the left arm reaches the front of the circle, it should be shortened by bending the elbow until the elbow leads the arm as it passes parallel to the left shoulder at the end of the throw. This bending or "shortening" of the left arm increases its speed since it is now cutting a shorter arc. This helps the thrower to get a "stretch" across the chest as they throw. This stretch provides the correct action of pulling the discus not throwing it by leading with the left arm. At the release point the thrower is striving to release the discus just as their knees lock out to achieve the highest possible height of release and still have the hips ahead of the discus. In a no reverse throw the left foot will remain facing the front as the right foot pivots. "NO REVERSE" throws are a good way to develop a good block. "BLOCKING" is a crucial concept in developing a good thrower. Blocking is a term that describes the stopping of one part of the throw or body to accelerate another part. In the release blocking refers to the stopping of the left side of the body at the release of the discus to accelerate the right side. Biomechanically, at the finish we have a rotating line across the shoulders. If we stop one end of this line (the left shoulder) the right end (the right shoulder accelerates). **(this can also be understood in terms of lengthening the lever created by the right arm and discus which rotates on the axis of the body and lengthening it from the center of the head to the left shoulder – thus accelerating the discus at release).** **The sudden stopping of the rotation by blocking produces the “slinging” action of the discus throw and can actually accelerate the discus compared to simply continuing the rotation speed achieved without the block – the sudden stopping of the right hip NO REVERSE TECHNIQUE must be considered carefully for high school athletes since it may lead to injuries of the left hip, abdomen, or left knee – also, the twisting and lifting action of the legs may be lost in the NO REVERSE TECHNIQUE used in discus throwing)**

4. The "Pivot"

Once a thrower can correctly stand throw, we begin to work backwards. The phase of the actual throw just before the finish in the power position is the pivot over the right foot to the power position. To work on this we do "PIVOT" throws. In a "pivot" throw the thrower begins with the right foot in the center of the circle and the left at the rear of the circle at 11 o'clock. He/she should be facing the left/center section of the throwing sector. Both hands and the discus are held in front of the body. To begin the thrower bends the right knee to a 90 degree angle just as the knee should be when the thrower lands in the middle of the ring on a full throw) and gets up on the ball of the right foot. The thrower initiates the throw by drawing the right arm back as far as possible while leaving the left arm facing the front. The right arm should be kept as parallel to the ground as possible avoiding the natural tendency to scribe a vertical pendulum with the discus. Once the discus gets as far back as possible, the thrower should pivot as fast as possible keeping the right knee bent (the head should not rise up during the pivot). The left foot should land on the ball of the foot at 5 o'clock so the thrower is in a good heel-toe relationship just like the standing throw. When the left foot hits, the thrower should have the discus back over his right hip and his left arm slightly bent pointing at 11 o'clock and then execute all the fundamentals of the standing throw but with the added momentum of pivoting.

The two keys to a pivot" throw are

1). keeping the thrower's weight in the center of the ring instead of rocking to the front foot and lunging on the throw. This can be worked on by having the thrower stop the pivot as soon as the left foot hits the ground and immediately pick the left foot up off the ground a few inches. This is impossible unless the thrower's weight is in the center of the ring over the right foot. **(one foot throws – right foot, of course – emphasize right foot rotation in this drill as well)**

2). keeping the discus back. The natural reaction of beginners is to lead the body's rotation with the discus, so the shoulders are always parallel with the hips instead of staying "wound up" with the shoulders trailing the hips, so that when the left foot hits, the discus is facing 12 o'clock and the "throw" (the distance the discus will be pulled after the left foot hits) will only cover 180 degrees or half a circle instead of a minimum 3/4 of a circle up to a full circle pull achieved by keeping the discus back over the right hip. To keep the discus back, the thrower must keep his left arm in front of him as he/she pivots. They must remember the arms basically should operate at 180 degrees opposite of each other. If they pull the left arm around too fast at the start, the right arm will also rotate too soon. One way to work on keeping the discus back is to

imagine the shoulder has a "latch". Once the discus is pulled back, the "latch" clicks and the discus is locked there until the power position is reached.

A thrower can also work on keeping the discus back by momentarily pausing when the left foot hits on the pivot, to feel the discus back, then finish. Beginners especially can benefit from "3 point pivot " throws. In a three point pivot the thrower will cup the discus with his fingers over the discus so they don't drop it. they will pivot 3 separate times and throw only on the third pivot. On the first pivot the left foot hits at 5 o'clock as always and the thrower pauses (they can also pick up left foot briefly here to see if weight is back). Then they pivot again continuing to rotate counterclockwise bringing the left foot back to 11 o'clock again. They again pause; this time they re-grip the discus so they can throw it. Then they pivot again to 5 o'clock and throw. The 3 point pivot gives a lot of repetition in keeping the weight over the middle and keeping the discus back in a short time). It is very important that the thrower stay up on the ball of the foot at all times and never let the heel touch. Once a thrower is proficient at "pivoting", they can work on increasing rotation speed two ways. They can "kick" themselves in the rear by bringing the left heel towards their rear as they rotate. **(we prefer the lower step through with the left foot which we think is quicker and the linier move of the left foot is quicker than swinging or lifting the left foot)** This shortens the swing (arc) of the lower leg and thus speeds it up. They can also think of "squeezing" the knees by bringing them together quickly as they rotate. This also speeds up rotation. **(this is the benefit of the REVERSE technique in discus throwing)**

5. The "Step In" or "South African"

Once a thrower can correctly stand throw, we begin to work backwards. The next step is coming out of the back of the ring. There are two common methods of working out of the back of the ring, off the left foot. Both begin with the thrower facing the front of the ring. The "STEP IN " throw emphasizes rotation while the "SOUTH AFRICAN " throw emphasizes the drive across the ring.

The STEP IN begins with the thrower facing the front of the ring. Both feet are together with the heels against the rear of the ring. The thrower holds the discus in front and then draws the discus back parallel to the ground as far as possible. As the discus is being drawn back, the thrower leaves the left arm facing the front of the ring. Also, as the thrower draws the discus back, they step forward with the right foot to the center of the ring. Normally, in a full cross ring throw the thrower's right foot lands facing approximately 2 o'clock. In the step in, however, we want to have the thrower work on rotation so we make them exaggerate the rotation. They step in and point the

right foot at 6 o'clock (straight ahead). This forces the thrower to rotate 360 degrees on the right foot before throwing. They must stay on the ball of the foot and keep their weight over the right foot to complete the throw. This throw must be done a little slower than a normal throw so the thrower can rotate completely. Once the thrower rotates and the left foot hits the power position, the coaching points are the same as the standing throw.

In the SOUTH AFRICAN throw the thrower again faces the front of the ring with the left foot at 11 o'clock. The right foot, however, is outside the circle similar to where it will swung when the right leg is swept wide out of the back in a full cross ring throw.

Here, though, the foot is stationary. A line drawn through both feet will point at 5 o'clock. To begin the throw, the thrower again swings the discus to the front and then draws it back as far as possible letting the body wind with it. When the discus is ready to be brought forward, the thrower drives forward off of the left foot sweeping the right leg in a wide arc. He should lead the right leg sweep with the inner thigh of the right leg, not the right knee. The thrower will exit the back of the ring with his eyes focused forward and upward. The left arm will be slightly flexed but long as the thrower drives forward off the ground. As the thrower leaves the ground with their left foot, the coach should see the right leg driving forward at a right angle to the body with the knee also at a right angle to the thigh. while the discus remains held behind the shoulder. This distance between the right knee and the trailing right shoulder is called 'seperation". The more separation the thrower achieves, the better. Good separation enables the thrower to land on the right foot, rotate and hit the power position with the left foot while keeping the discus held back as far as possible so the thrower gets a long "pull". A thrower who usually brings the discus forward at the same time as the right leg usually achieves little or no separation. In addition, the discus should scribe a wide arc with its lowest point at 12 o'clock the sweeping out and up as it is brought around past 11, 10 and 9 o'clock. The thrower should drive towards the right-center (**right facing the sector**) portion of the sector since the momentum created by the sweeping right leg being brought back inside will push the thrower to the left. A thrower who drives straight ahead will end up on the left side of the throwing circle while a thrower who drives to right center will usually end up correctly positioned. After the thrower's left foot leaves the ground, the right leg is actively pulled underneath the body to increase rotational speed. As the right foot is pulled into the center, the discus should scribe as wide an arc as possible. Ideally the arm carrying the discus remains perpendicular to the body. And, as the body turns and the discus points outward towards the throwing sector at 6 o'clock, the discus arm should be pointed at the same angle the discus will be released at when the throw finishes. The discus' orbit will be lowered as the rotation begins and in the back and high pointed at 6 o'clock. Once the right foot hits the center facing approximately 2

o'clock, all the coaching points of the "pivot" and "standing throw" apply. **(emphasis should be on ensuring an effective block since the added knee drive across the ring will cause the athlete to have more difficulty staying in the ring – although athletes may be tempted to throw too many South Africans due to the increased distance achieved -- too many of these throws can create fowling problems. The athlete must be conditioned to re-establish the proper block to prevent excessive fowling)**

6. The "Full Cross Ring" Throw

Once throwers master the preceding steps, they are ready to begin throwing from the back of the circle. All beginning throwers will want to move to the back very quickly, but if they are not ready, they develop bad habits which can be very hard to break. If the coach is not always with a thrower because he is working with older throwers, young throwers throwing full cross ring throws prematurely often develop incorrect "muscle memory" ie. patterns of movement which become difficult to correct. Try to spend the majority of time with the top throwers of any grade, then beginners (especially promising ones of any grade level) and then older throwers (sophomores, juniors, seniors) of average ability. **(we are always the last to leave the track areas because we must devote time to all ability levels of throwers – we establish times for those ability levels to come to the discus throwing areas for targeted workouts – this promotes multiple event athletes and allows limited numbers of coaches to produce large groups of throwers at all levels – Saturday practices are also the reality when blessed with large numbers of athletes in the throws)**

To begin the full throw, the thrower assumes a position with his navel aligned at 12 o'clock. the feet should be evenly distanced from that point and the knees flexed about 45 degrees. If the thrower begins with the discus in their right hand at their right side, all they should need to do to initiate the throw is swing the discus back a little and then across the body to the left beyond the chest. Then the thrower should draw the discus back until it is behind the thrower and almost over the left foot. They will rotate the body as they draw the discus back. The left arm should be relaxed and slightly flexed staying 180 degrees from the throwing arm. As the discus is being drawn back, the left leg should be pivoting on the ball of the foot towards the discus and maintaining the same angle at the knee. **(we use the simple coaching point that the thrower should rotate far enough to see the entire sector before they begin their rotation out of the back of the ring)**

In the interest of stability, it can be advantageous to keep the right foot flat on the ground as the arm is withdrawn and starts forward. The thrower's weight can also be

shifted over the right foot as the discus is drawn back. If a coach has all throwers utilize this simple start to the throw or any equally quick and simple start, he will avoid the waste of throwing time lost when throwers crank the discus back and forth several times. With many throwers using the same ring, this is an inexcusable waste of time. Excessive cranking the arm gains nothing. The thrower should get mentally ready to throw before entering the ring not step in and crank until he feels right. **(this not only a waste of time, but looks silly and threatens the loss of limited throwing opportunities by risking the dropping of the discus outside the ring)**

Once the thrower reaches the farthest point of drawing the discus back, it is important that they initiate the throw by shifting the weight towards and over the left foot and begin to rotate the left knee forward. They should not initiate the throw by starting to bring the discus back. Again, they can imagine a "latch" clicking when the discus is completely back keeping it back. The left side of the body turns in unison at the start of the throw. The left foot, left knee, and left arm are **all on the same vertical line** as the thrower begins to turn. It is important that the thrower develop a wide right leg sweep to generate power. To utilize the wide right leg, the thrower needs to **pull** the right foot off the ground when their chest reaches a point about 10 or 11 o'clock. Once the right foot is pulled off the surface, they should keep the knees apart to avoid leading the **rotation** with the right knee. A common error among throwers is to pivot both feet until they are 90 degrees from the starting point and facing directly left before **pulling the right foot created by the rotation action of the left foot, left knee, and left arm.**

The thrower must also maintain level shoulders during this rotation out of the back. A common fault of beginning throwers is to drop the left shoulder to drive the right knee to the center of the throwing circle. Keeping the left arm at shoulder height should allow the proper rotation and drive to the center of the ring.

The right leg should sweep outside the circle slightly flexed and as the thrower's body reaches a point where they are facing down the right foul line, the leg accelerates forward leading with the inside of the thigh instead of the knee. **(soccer kick with the inside of the right foot as the knee is driven to the throwing ring's center)** The thrower's eyes and left arm should be aimed just above parallel to the ground. All this time the angle of the left knee should not change. If the coach stands behind the thrower at 12 o'clock, the coach should not see the bottom of the thrower's shoe when they drive forward. If the sole is visible, they are leading with the right knee not thigh. **The outside side of the shoe should be seen by the coach when the proper right knee drive is executed by the thrower.**

When the thrower drives out of the back, they should be driving to the right of center since the wide leg sweep will pull them left when it is drawn back in. Whether they drive at the foul line or just right of center depends on the thrower. The aiming point should be adjusted by observing the thrower's feet when they hit the power position. If a line drawn between the thrower's right heel and left toe is to the right of a line drawn down the center from 12 o'clock to 6 o'clock, the thrower needs to stay on the left leg longer continuing to rotate before they drive out. If this "heel-toe" line is to the left of the center line, they need to drive off the left sooner. Ideally, the "heel-toe" line will be the same as the center 12 to 6 line.

When the thrower's left foot is leaving the ground, the right hip and right knee should be as far in front of the discus as possible. As discussed in the SOUTH AFRICAN section, this is "separation". Having separation insures that the thrower is keeping the discus behind them and that when they hit the power position, they will have a long pull.

Many throwers will have the discus even with the right hip as they exit the back. This leads to a short pull when the power position is reached since the discus will be around 1 o'clock when the left foot hits not 4 or 5 o'clock as it should be. The body should be upright during this "unseating" or exiting of the back. When the thrower leaves the ground, the right thigh should be actively pulled in underneath the body to increase rotational speed. The vertical axis (a line drawn through the head to the rear) of the body should go from near vertical upon unseating to tilted toward the back as the discus is rotated toward the front of the circle. Ideally the chest remains erect and the head is an extension of the spine not bent forward.

When the right foot makes contact with the center of the circle, the foot will be somewhere between 1 and 3 o'clock. It should also be very near the center of the ring.

If the thrower lands in the back half of the ring usually accompanied by the foot facing 12 o'clock, they are not generating the speed across the ring that they should be. In this incorrect scenario they will also usually lunge forward while throwing instead of turning on a tight axis after driving to the landing position. If the thrower lands correctly, the left foot should be pointing 180 degrees away. Beginners should not rush the right foot coming down but should rush the left coming down after the right. The rhythm of the throw is "sweeeeeeep, boom-boom" as the feet come down. If a thrower consistently fails to drive across the ring, a towel can be laid across the ring half way across from 3 o'clock to 9 o'clock. Then makes the thrower drive out of the back to clear the towel as he sets up to throw. the rhythm of the entire throw is constant acceleration. A beginner should be slow to fast. An accomplished thrower can be moderately fast to faster. However, the great majority of throwers are too fast out of the back. Beginners usually leave the back too fast and then have a hesitation in

the throw due to faulty technique. For example, they may fall out of the back with a lot of speed; and then land on a flat foot or lunge forward at the finish stopping their rotational speed resulting in reduced speed at release. They must understand the only speed that matters is velocity at release. Any speed that is generated must be able to be carried through to the release.

After the thrower hits the power position the coaching points are the same as for the standing throw. The thrower must try to release the discus at shoulder level with an extended arm and a good block. Ideally, the knees should be locking out as the discus is released. A thrower, however, who generates great speed may still have the right knee bent on release. The thrower should "chase" the discus trying to maintain contact as long as possible. The majority of throws should land in the right-center section of the sector.

A thrower should not rush the throw or the reverse. The emphasis should be on driving off the ground and let the legs reverse naturally. **The discus should be released with the feet still on the throwing surface and not off the throwing.**

7. "Troubleshooting"

The best position for a coach to view the throw is from a spot outside 10 o'clock about 10 - 15 feet away. From this spot they can see the right leg sweep, and thrower exiting the back, and the power position. the best videotape is also taken from this angle.

Other views also can be used. For example, from the rear a thrower's line across the ring can be checked. **(We use the 8 o'clock position to the 9 o'clock position to also observe the release position of the thrower – many times, the greatest threat to a thrower's success is the foul at the front of the ring and the position of that finish is best observed from the 8 o'clock position – depending on what you are trying to see, the 8-10 o'clock position is the best angle from which to analyze a throw)**

"FALLING OUT OF THE RING ON THE LEFT SIDE"

This is probably the most common fault especially in beginners. They finish the throw with the head pulling down to the left, the arm well above the shoulder. Usually the discus has the outside edge far higher than the left and the thrower falls out of control out the left side. This is caused by the thrower not transferring their weight over the left foot as they begin the throw. **(this will most likely be caused by dropping the left shoulder out of the back of the ring – the beginner is usually anxious to enter the drive and rotation phase in the middle of the ring – they may also assume that the faster & quicker you get to this phase the better the throw)** As a result

their center of gravity is not over the left foot and their vertical axis is tilted too much toward the 3 o'clock side of the ring. They continue to rotate and throw on that axis and fall out that side. Throwers working by themselves should know this and any time they fall out of the left side, they should get over the left foot more exiting the back on the next throw. No Reverse or "stop" throws (the thrower begins a full throw but cups the discus with his hand and stops when they hit the power position) **This flaw is usually caused by the lack of rotation in the center of the ring – usually, it is the right heel that is in contact with the surface instead of being on the ball of the right foot in the center rotation phase.** If they are on balance, they can hold the power position when they hit it and not fall left or right. **Throwers with balance problems can work on this by going on a large hard surface such as blacktop or cement and working on driving out of the back to set up on different lines. Reviewing and relearning the rotation phase out of the back of the ring will assist the thrower in resolving balance problems.**

"ENDING UP IN THE HOLE "

The "hole" is the section of the ring by 4 or 5 o'clock. If a thrower ends up in the corner but is not falling out on that side, they are on balance but not on the desired linear path from 12 to 6 o'clock which produces maximum power. They are probably staying on their left foot too long and over rotating. They need to work on driving out of the back at an earlier point. They can also use the drill where they drive out at different angles and/or different spots to the right of the center line (12-6 o'clock line) of the ring. Several things can cause this problem and requires analysis of the entire throwing technique

"THE DISCUS" ITSELF IS TOO VERTICAL DURING FLIGHT"

Several problems can cause this. First, the thrower may be driving too far into the hole (left side of the circle) causing them to be leaning back into the center with the upper body. This means as they throw their vertical axis is tilted right as viewed from the back of the ring so their throwing arm is lower than it should be even though it may be perpendicular to their body. If the coach watches the thrower's feet, they will see the thrower's right foot come down left of the 12-6 o'clock line and the left foot also come down left of the line and also probably not get past the right into a heel-toe relationship. They will usually stumble a little back to the right as they throw. To work on this, have the thrower do no reverse throws and stop throws. This makes them stay over their feet as they throw or stop and they can develop a feel for being over their feet correctly which helps them achieve a vertical axis. One other reason for a vertical flight may be that the thrower's orbit is reaching a high point at 3 or 4 o'clock as they turn instead of 6 or 7 o'clock. This means that the bottom of the orbit before release is at 8 or 9 o'clock. When the low point is this close to the release, the

thrower does not have time to pull the discus back up to a correct release point near the shoulder.

"THE DISCUS" LOOKS ROUND LEAVING THE THROWER" (TOO GREAT AN ANGLE OF ATTACK)

As viewed from the rear, correctly thrown discus will have the right edge a little lower than the left edge (and it will flatten during flight). The front edge will also be a little higher than the back. It not, however, appear as a "moon" (almost circular). A discus that looks round is not very aerodynamic. With a beginner the usual cause of this is that they are getting the hand too perpendicular to the ground with the right thumb up as they throw. It should be only a little above parallel. With all throwers lunging forward in the power position also causes this. **Since the thrower is lunging and can't throw the discus at the proper angle of release, they turn the hand up (increasing the angle of attack) in an effort to get the discus flight up.**

Cart Wheel Throws –

Action: release of discus is more vertical path due to the path of the right arm being higher than the right shoulder

Cause: 1. Dropping the left shoulder in the back of the ring & failure to keep shoulders level in the drive phase of the throw – this causes a balance problem to the left, overshooting the 12-6 line and stepping into the “hole or bucket to the left with the left foot – the lowering of the left shoulder in the release phase causes a raising of the right shoulder resulting in a “cart wheel” type throw with the discus right side being much higher than the left

2. Stopping the rotation of the right foot, hips during the rotation phase in the middle of the ring – causes the thrower to lunge forward in a linear rather than rotational finish to get pull on the discus resulting in a high release and a “cart wheel” looking finish

Correction: 1. Broom drill – use any wooden broom handle that the athlete can carry on their shoulders as an aide to keep their shoulders parallel out of the back of the ring rotation will help correct the “shoulder drop” out of the initial rotation phase

“Worm Burner Throws”

Action: The discus is thrown with too low an angle of attack causing the discus to fly low with no loft

Cause: 1. The discus may be held incorrectly and too flat at release – check the angle of release to see if it matches the angle of attack – the thrower may have the right trajectory defined by the throwing arm but the hand is over rotated with the thumb being too low for the desired flight of the discus. 2. A weak block allows the right leg axis to move too far forward causing the thrower to be too far forward of their block (left leg axis); 3. The discus is carried at the shoulder level throughout the entire throw resulting in little or no lift; (Combinations of the mentioned causes may contribute to the lack of 35 – 40 degree desired trajectory of the discus flight); flaws in the release or delivery phase of the throw may contribute or be the cause of the low trajectory of the discus throw.

Correction: 1. Review the grip & release basics, review standing throw watching for the athlete to rotate the discus forward (flatter) thus losing the proper angle of attack – taping of the athlete may be necessary to watch for combination faults; 2. Review standing throw basics ensuring the thrower is blocking properly – especially that the left knee is locked and the left arm is properly lifted by utilizing the “peak & lift” method; 3. Review initial rotation phase out of the back of the ring to ensure a lift of the discus above the throwing shoulder as the right knee drive phase occurs out of the back of the ring; Review the power & release phases to ensure the thrower is peaking and lifting the left arm following the left foot plant at the front of the ring initiating the delivery or release phase of the throw – ensure the athlete is not bending at the waist during the release phase.

Persistent Fowling at the Front of the Ring:

Review the relationship between the right leg axis and the left leg axis and their relationship to fouling – when the right leg axis aligns with the left leg axis or exceeds it, the result is a reduced ability to change linear momentum into rotational momentum and/or remain inside the discus ring – coaches can see this in the forward lean at the finish where the thrower is leaning forward of or over their left foot.

Causes: Excessive lean out of the initial drive phase of the throw; excessive “stretching the ring” or knee drive too low in the initial drive phase of the throw; bending at the waist in the knee drive phase of the throw; failure to keep the discus back in the initial knee drive phase of the throw causing the thrower to lunge into the release/delivery phase of the throw

Corrections: Review the knee drive phase of the throw to ensure that: 1. The shoulders are parallel with the surface out of the back and that the left shoulder is not being dropped; 2. Check the location of the target for the right foot during

the knee drive phase of the throw – middle to 6” beyond the center of the ring; 3. Ensure a “peak & lift” technique for the left arm to check for the left arm path being too low thus pulling the right leg axis too far forward; Review “step through” drills to ensure proper relationship between the left and right leg axes, bend at the waist, proper trajectory of the left arm during the delivery/release phase.

Wounded Duck Throws:

Action: the discus wobbles or “flutters” in flight – knuckle ball look with the discus having none or little spin;

Cause: Improper hold and/or release of the discus off the index finger – the thrower may be “squeezing” or “picking” (pulling up on the outside of the discus) at release;

Correction: Review the basics of releasing the discus – may need to use a camera to see the exact cause of the throwing problems – we once spent two weeks trying to solve this problem only to find out that the thrower had healed a blister on his index finger and had switched to his middle finger as the release finger causing the “flutter” appearance of the discus in flight.

Throwing Speed too Slow

Action: the thrower appears to be too slow footed during the throw;

Causes: throwing phases most likely not transitioned smoothly – rotation on the left foot too slow and requires practice, rotation in the middle ring phase of the throw may be stopping or too slow, pulling the left foot through in the transition from middle ring rotation phase to the power position phase not fast enough, or a balance problem which causes leg lifting (especially the left leg into the power position) and therefore slowing the throw transition.

Correction: practice step throughs for better transition; practice South Africans for increased transition speed and smoother transitions; balance problems are usually caused by shoulder dips or over shooting the middle of the ring (left or right of the 12 – 6 o’clock line of the ring).

Throwing Speed too Fast

Action: thrower is too fast out of the back – usually caused by not driving the right knee to the center of the ring – thrower throws out of a comparatively small circle out of the back of the ring (throwing out of a dish pan)

Causes: can be caused by dipping the shoulder in the back of the ring – thrower simply starts the throw moving through the knee drive phase too fast

Correction: 360 rotation drills at the desired speed – broom drill to check any shoulder dipping that might be contributing – extending the left arm at shoulder height during the rotation & knee drive phase out of the back of the ring – adequate knee drive across the ring (stretching the ring).

Weak Block; Left Arm Over Rotates Upper Body:

Action: the thrower over rotates the block by rotating the left arm behind the left hip –

Causes: Lack of solid and adequate block by the left arm – the left arm may be driven too low on the release allowing no lift on the discus and making it more difficult to pull into the lift side to stop the rotation of the shoulders

Correction: locate the thrower at one of the cage poles holding the discus cage so that the right side can throw the discus and the foot relationship can be properly maintained and place the left shoulder against the pole and have the thrower throw thus feeling the block position; review the proper blocking technique and position and the importance of the block to the acceleration of the discus at the release/delivery phase of the throw.

Weight Training for Discus/Shot Put Throwers

The following weight training program is a list of lifts and other training techniques used to develop high school weight throwers. Although we have daily plans and programs for each thrower, we tend to utilize the same basic lifts for all throwers in our program with consideration given to gender, athlete needs, injuries, athlete safety, and common sense.

Lifts: Methods consist of slow lifting, explosive lifting, high reps/low weights, low reps/max weights; approved shoes, weight lifting gloves & lifting belts are required of all in the weight training program.

Recommend no more than 4 days per week on Off Season Training/In Season Training Depends on Facilities, Needs of Athletes, Age & Experience of Athletes, Time Allotted to Training & Throwing

Arms & Shoulders:

Bench Press
Tricep Curls
Bicep Curls
Inclined Bench Press
Neiders
Single Arm Military Press
Pectoralis Machine

Hips, Lower Back, Abdomen

Sit-ups/Crunchers/Back-ups with graduated weights,
Plate training
Wilkins Rotations
Dead Lifts
Cleans,
Squats

Legs

Quad Press
Squats
Ham Curls
Plyometric Box Jumping
Hurdle Hopping
Bun Running
Hill Running,
Hill Frogs
Steps/Stadium Running/Hops

Speed/Quickness

30 meter sprints,
Carioca,
Five spot,
Rope jumping,
Rope ladder,
Step-ups,
Backward leg drives,
Agility runs

Throwing Objects Training

Medicine Ball Training – rotations, side to side, toe touches, sit-ups, waist throws,
Soccer Kicks,
Tire Throws,
Power Ball Throws

Typical Workout – Off Season

Monday:

Upper Weights

Bench 3 X 10 @ 75%; 2 X 3 @ max,
Squat 3 X 10 @ 75%; 2 X 3 @ max,
Bicep Curls 3 X 10 @ 80% max; 2 X 3 @ max,
Pectoralis Machine 2 X 25 @ 75% 2 X 5 @ max,
Neiders 3 X 15 @ 80% 2 X 10 @ 90%,

Tuesday

Leg Agility

30 meter sprints 2 X 2 @ 75% 5 X 3 @ 100%,
Carioca 5 X 3 @ 100%,
Plyometric Box Jumps 8 X 4 boxes @ 18/24/30/36,
Rope Jumping 6 X 30 seconds each,
Bun Running @ 3 X 30 seconds,
Agility Runs 3 X 45 seconds

Wednesday

Lower Weights

Squats 3 X 5 @ 75% 2 X 2 @ max,
Plate Training 2 X 10 @ 75% each (side leans, toe touches, pull overs, back ups on machine,
sitting rotations),
Wilkin's Rotations 3 X 20 @ 80%,
3 X 5 deadlifts @ 90%,
Cleans 5 X 3 @ 75%

Thursday

Upper Weights/Agility

Tricep Curls 3 X 10 @ 75% 3 X 3 @ max,
Inclined Bench 3 X 8 @ 75%,
Bicep Curls 3 X 10 @ 80%,
Sit-Ups 3 X 15 @ 10 lbs,
Crunchers 2 X 10 @ 5 lbs,
Rope Ladder Agility 3 X 8 @ 10 seconds,
Jump Rope 3 X 60 seconds,
Five Spot Agility Drill

Friday

Film Study – throwers watch world class thrower's technique on-line or from CDs

Videos for discus training and teaching:

The ten best throwers ever in the discus by average.

http://www.youtube.com/watch?v=9DgK_qiSut8

Weight Training for the Discus with Plates

<http://coachingtrack.hubpages.com/hub/Coaching-the-Discus-Throw>

European Championships – Wolfgang Schmidt

<http://www.youtube.com/watch?NR=1&feature=endscreen&v=xbcW7Hw2fHg>

Standing Throw video:

<http://www.coachesdirectory.com/new/coachesinsider/track.php?videoID=1187707808001>