Hammer Throw Basics

By Todd Taylor

Introduction

I am a senior citizen hammer thrower, coach (USATF Level II Throws, junior college) and enthusiast who helps anybody who is interested in improving. As a master's competitor, I have won over a dozen indoor and outdoor USATF Masters National Championships. My wife, Joyce is also an accomplished thrower, Masters National Champion, and my training partner.

By nature I am an "analytical" type and I have also had the benefit of some of the best coaching available. My purpose in this article is to simply share through trial and error what I have learned, what I think makes sense in terms of ease of comprehension, and what verbal and imagery cues work for me. Cues that work for some people do nothing for me. In the text of this article, I have tried to place most of the "cues" in boldface type font to assist the reader and also highlight some "key points" for success. Some athletes may have to forgive my analogies to other sports with which they are not familiar. I hope that you find it beneficial in being able to learn and enjoy this unique event. When I refer to common problems & errors, I'm usually talking from personal experience—been there…done that! I have made attributions to coaches/athletes where appropriate.

Fun but Frustrating

The hammer throw is often acknowledged as the most technical of the throws to initially learn and eventually become proficient. This is largely due to the centrifugal force of the implement during rotation and the fact that you are shifting your balance and weight against the force of the ball as it speeds up. **Technique rules in the hammer!!** Hammer throwing can seem downright unnatural and something our bodies were not meant to do. Despite size and strength disadvantages, shorter and smaller athletes with good technique often perform well against larger competitors. This event takes a lot of patience. Because it can be frustrating, it will be helpful to understand a little bit about the athletic attributes of a good hammer thrower and the physics involved in the throw.

Athletic Attributes and Abilities

A stereotype exists for all track & field throws of the big and strong athlete. "Functional strength" is essential, but the key athletic attributes for a hammer thrower are balance, rhythm and timing. "All movement has balance and rhythm" is a key concept of hammer coach Stewart Togher. Balance is needed to counter the weight of the hammer and sustain the rotational forces involved. Good foot speed and general quickness is helpful, but speed in the hammer is a result of a gradual speed progression or buildup with each subsequent turn with the implement; this is contrasted with the quick explosion of the "glide-style" shotputter. The rhythm of the throw enables the speed progression. Timing is the ability to hit precise positions optimally at key points or stages during the winds, entry (transition from winds to turns) and turns. Elite thrower

Tibor Gecsek, for example, reinforces these key attributes by emphasizing multiple repetitions in his turning drills and plyometric jumps, hops, skips, etc.

Key Point: **Gaining Strength** Lower body and *core strength* (lower back, abs, obliques) is more important than upper body strength in the modern throwing technique. Variations of the Olympic style lifts (*explosive power*) are the foundational weight training for all throws—power cleans & snatches (floor & hang), pulls, squats (front, back & jump), lunges & step ups, push presses, bench presses (flat & incline), etc. Plate twists, pud throws, Swiss ball and other exercises along the pathways of the throwing motion and which build the stabilizer muscles (*functional strength*) are also very important for the hammer thrower. Strength in the hammer is needed for counterbalancing the force generated by the hammer and to get into and hold the key positions during the throw. A great finish in a hammer throw is not a huge upper body testosterone movement, if done correctly. The infamous "thrower's yell" should not be the grunt at the end of a muscle tightening and straining yank on the implement; rather it should simply be the release of energy from a smooth, controlled, forceful movement.

Key Point: **Too Strong is Bad** One can certainly achieve a measure of success "muscling" the hammer and weight (its indoor version), however, this can create bad habits that interfere with proper technique to throw far and maximize your potential. Remember, as in all the throws, the "feeling" of your best throws is "effortless" because of the fluidity and smoothness of the ironically explosive movement, i.e., balance, rhythm, and timing. Generally, strength gains should parallel improvements in technique and training plans should favor drills, agility, explosiveness and throwing during the competitive season. And last, but far from least, good flexibility and range of motion throughout the throw is very important—one of those paradoxes…flexibly strong.

Key Point: **Technique Rules!!** For relative perspective on athletic attributes for success in the hammer throw, consider the success of American throwers at the open level of international competition. Americans are traditionally at the top of the shot and discus world rankings and these throwers often started at the elementary, junior high and high school levels. Few American states throw the hammer or javelin in high school and few American athletes can meet the Olympic "A" Standard (minimum qualifying mark) in those events. In Eastern European countries, youth begin throwing the hammer at the American equivalent of 7^{th} & 8^{th} grade using very light implements. The implement weight is gradually increased as they learn the proper technique to throw world class distances; only then do they begin serious weight training to increase their strength levels. In short, they learn to throw far before they even worry about strength.

Hammer Throw Physics 101

Understanding the rotational forces involved and the determinants of distance will greatly assist your development of hammer technique skills.

Key Point: **Countering the Ball** As the hammer increases in speed, the ball has more outward force pulling against your body; therefore, you must counter the increased

speed/force by setting your body against (opposite) the weight of the ball. This explains the awkwardness and jerkiness that many beginning throwers feel as the ball moves around in the orbit as they learn one turn and then add turns—one feels like the ball is going to pull them off their feet or out of the circle. In reality, the hammer throw becomes a constant leaning where you have to "trust" that the hammer will hold you up and keep you in the ring. This "countering the ball" concept is subtle; you don't just lean real hard all at once and jerk the ball out of its orbit path.

Key Point: **Turn with the Ball as an Integrated Unit** Related to basic physics of the throw is the concept of the so-called modern technique of hammer throwing—"geo-synchronous orbit". In the old technique of "counter and drag", the thrower pulls the ball with the left arm/side and drags it off of their right side as they turn. It takes great strength to counter the ball and pull/drag it while on one foot for much of that style of throw. The Russians took hammer throwing out over 80m in distance with a fundamental concept in the modern technique—the "hammer thrower system" is the thrower turning with the ball as an integrated unit and all of the thrower's energy ideally goes out into the ball. The other key aspect is that one attempts to maximize the amount of time that he/she is in "double support" phase (i.e., both feet on the ground) because greater force can be exerted on the hammer when you are more stable with two feet in contact with the ground. Also, the thrower **drives with the right foot and leg** (like the pushing leg while on a scooter or skateboard) and **"pushes the ball"** with the right arm (like a tennis forehand stroke).

Key Point: **Stay Long** Distance in all of the throws is a function of the release angle & height and implement velocity. Distance in the hammer throw is a function of radius (arm length), ball (not body) speed, and angle of release. The genetically blessed with long levers have a distinct advantage, if they have decent balance and rhythm. Therefore, for the rest of us mortals, "staying long" with the arms from the winds, entry and in all of the turns through the release is absolutely critical.

Key Point: **Ball Speed not Body Speed** The object of speed in the hammer is not to turn like a helicopter rotor "whirly bird" but generate **"ball speed around your body"**. Optimum angle of release is obtained by starting with a relatively flat orbit of the ball during the winds, and then the momentum of increased acceleration in the turns **increases the angle of the orbit plane with each turn**. If you establish the right "high and low point" of the orbit, you will find yourself **"throwing the ball up"** at release and not a baseball-like line drive shot off the center field wall. While there is a "posting up" of the left turning axis leg (right-handed thrower), a common fault is not **"throwing out into the sector"** at the release. Instead of continuing a ¼ heel/toe turn and rotating the hips around that blocked left leg (so you are looking at the sector with your chest), often the hammer incorrectly gets thrown over the shoulder like a sack of potatoes.

Key Point: **Learning Cues** So, just by understanding the basic physics involved, you have some key "cues" for good hammer throwing technique. A quick word on "cues"—some of us learn visually, others by hearing, and yet others by both methods. The concept of "sitting against the hammer", for example, works for some as the key to

counterbalancing, yet others take it too literally and get bent forward at the waist and off balance; and still others try to mechanically insert the cue and motion into a portion of the throw not realizing that the cue means a constant natural reaction to the increased speed/force of the ball.

A common problem also occurs when throwers try to emulate certain "style" aspects of an elite thrower on video while forgetting that an 80m thrower counters forces far greater than the novice-to-intermediate thrower will ever experience. So, try to comprehend technique fundamentals rather than "being like" an elite thrower with whom you identify or enjoy watching.

Posture

Posture is critical and often overlooked. Getting the right posture at the beginning and maintaining it is the key to good balance throughout the throw.

Key Point: **Posture=Balance** You want to be **bent in the knees** (not the back) enough in a standard athletic "ready position" (football linebacker type) with **back straight,** so that you feel your calves/Achilles tendon pulling on you a little bit. **Feet** should be about shoulder width or a little wider with your weight evenly distributed between forefoot and heel and between left and right feet. A good metaphor for me is to imagine myself as a **tetherball pole** that is unwinding the tetherball around me—the more you hit the ball, the radius increases and the ball accelerates. The pole is a solid, anchored foundation in the middle of the ball's increasing speed. You are the calm in the center of a storm about you.

The **head** (a fulcrum for the body) is to be looking straight ahead; your **hips/butt** (the body's other fulcrum) counterbalance the force of the ball. It's best if you can pick up the path of the ball with your peripheral vision (keep your head level and **eyes** looking straight ahead) rather than looking right at the ball; otherwise most beginners will bend over when they rotate around to the back of the circle and get off balance with no counter against the force of the ball.

Key Point: **Tall and Long** The **arms** should be kept as long as possible from beginning to end of the throw; remember, radius is a key distance variable. Another tendency for beginners is to bend the arms and pull the hammer in towards the body to help stabilize them. You have to try to be relaxed in the upper shoulders and feel as long a radius as possible. Whenever you feel the hammer is pulling/bending you over, bend your knees in front of your chest; this automatically places your butt/hips behind your heels as a counter to the ball and you will regain your balance. Beginners may feel that as the hammer is at its low point in the back of the circle and then at its high point of the orbit at the front of the circle that they are on the "tilt-a-wheel" ride at the amusement park. The more you practice turns with and without the implement, the more quickly this sensation will subside.

The Winds
The winds impart initial momentum to the implement and are the key to establishing the rhythm of the throw which in turn enables a speed progression and gradual increase of the orbit angle to its ideal angle at release. The thrower faces the back of the circle and generally winds the hammer around him/her twice and then begins the entry into the first turn when the ball comes around past the center of their body at the end of the 2nd wind.

Key Point: **The Grip** The right-handed thrower grips the handle with the left hand then comfortably wraps the other hand around it. The thumbs rest on the outside of the handle and are pointed upward during the throw. You will either need to tape the left fingers or purchase/make a throwing glove with the fingertips exposed. The optimum grip position of the handle on the fingers is in the middle portion and not closest to the palm. Some throwers just use three fingers of each hand on the handle to even further extend the radius; however, many find this uncomfortable and/or too hard on wear and tear of the hands. Beginners may wish to both lightly wrap the fingers of the left hand along with using a glove until their hands are used to the pressure on the hands. Now jumping forward with a little heads up on a sore and/or beat up left hand from throwing the hammer—once you get beyond very beginning stages, this usually means you are over engaging the left side, pulling on the hammer, and dragging it during the turns.

Key Point: **The Start** The winds or swings can be started several different ways depending upon preference. The classic wind is to place the ball in the circle just off to the right and behind the right leg; the handle is gripped with both hands and the ball is then pulled around in front of you and up towards the left shoulder. I personally don't prefer this style because there is a tendency to bend around to grip and pull the hammer at the start and not stay in that good posture, i.e., one gets bent over right from the start. With both hands on the handle at the start of the wind, two other wind starting styles are to place the ball: 1) between the legs and behind you inside the circle (ball is swung forward & then back to the right before swinging it in front of and around you), or 2) outside the circle directly in front of you (ball is swung back to the right & then across the front). Yet another way is placing the ball behind and to the left of the left leg with only the left hand gripping the handle (palm up); the ball is swung forward and up in front of you to a comfortable height, back along the right side, and then across the front. The purpose of the last three methods is to establish a little rhythm and momentum right at the beginning.

Key Point: Full Shoulder Turn Regardless of the starting position of the ball, the **left shoulder initiates the movement** of the implement across the front of you for the first wind (rt. handed thrower), rather then simply lifting the implement up with your arms. You should keep looking straight ahead and keep your head still as you rotate the shoulders to the left, feel the ball directly behind your head, and then turn the shoulders back to the right as the ball comes around. Often beginners will wind with their arms only and not get a full shoulder turn; the **full shoulder turn will help you establish a longer radius**. If you **turn your hands over** with the back of the right hand facing up

as the ball passes in front you between the legs, it will help you get into a good full shoulder turn as the ball travels left in the wind.

Key Point: **Wind Nice and Easy** You are simply imparting initial momentum to the ball in the winds. Don't be winding so fast and hard that it pulls you out of that good starting posture position. Avoid bobbing up and down or weaving/leaning from side to side. A good check on your winding speed is the **"wind & turn drill".** In this drill, you wind the hammer once, do one turn, and upon rotating back to your starting point (at the back of the circle) you go right into another wind & turn, wind & turn, etc. If you are not in a good stable position when you wind the second time, you will be pulled off balance, which means you are winding too fast. [The beginner or person just throwing from the stand position or one or two turns will obviously need to generate greater speed in the winds prior to release.]

Key Point: **Winds Establish the Throw's Rhythm** Some throwers are simply winding around themselves with no particular emphasis during the orbit other than setting the low point directly in front of them. However, I am heavily influenced by Lance Deal, the American record holder in the hammer and 35# weight world record holder, and his coach Stewart Togher. For many beginners, I have found the "pendulum wind" concept helps them understand the rhythm and key positions of the throw. Right from the winds, Togher and Deal emphasize the "main event" of the throw that occurs at 180° directly behind you out into the middle of the sector at release of the hammer.

If you think about the pendulum on an old clock, the pendulum is moving fastest at the bottom after a gradual gravity drop from the top of the arc. Think of the hammer orbit like the pendulum arc—180° behind you being the top and 0° degrees between your legs in front being the bottom. After you have turned the shoulders left, then shortly you should distinctly feel the ball at 180° (directly behind the head and out toward the sector) as the shoulders turn right, and you **feel the gravity drop of the ball** to 0° (directly in front of you).

Feel and focus on the rhythm that the gravity drop of the ball establishes in the winds. To feel this rhythm correctly, practice slow multiple winds. This aspect of winding the hammer I feel is more crucial for learning the throw than the teaching of a parallel right forearm and upright left arm forming a window in front of your head (good form by the way)—beginner-to-intermediate throwers get so focused on making a window in front of them that they don't get **"connected with the ball"** at 180° behind them during the winds.

The orbit of the 1st wind around the body is not critical, but as you come back around to the front to begin the **2nd wind**, you want to consciously **set the low point of the ball directly in front of you**. On the 2nd wind, you want to set the **radius out long** (be relaxed in the shoulder girdle), sweep the ball **out around the left side**, and **let the ball "run long".**

The Entry
The traditional entry of the throw is considered the start of the left heel/right toe turn as ball passes by directly in front of you (hard for discus and rotational shot throwers who may try to turn on their left forefoot). It is very important to maintain good posture, let the ball turn with you, and not dip or lean with the left shoulder to start the turn.

However, I have found it easier for beginners to learn the **"loose upper body"** style of throwing. One of its proponents is a successful American small thrower and collegiate coach, Ken Norlen, at UC Davis. I have found that his three key principles or cues allow one to forget about footwork and concentrate on balance and rhythm instead: 1) see the ball, 2) send it by, and 3) step to the ball.

Key Point: **Entry Begins at Top of 2nd Wind** I need to back up and talk about where the "entry" really begins for Togher and Deal. Deal uses the metaphor of the fly fisherman who casts the line rhythmically several times before setting the fly on the water where he wants it to land. Here's how to apply the metaphor—in the 2nd wind (as the ball is behind you at 180°) the ball falls in the pendulum gravity drop down through 0° in front and all the way around again out to 180° behind you, as you step quickly toward the ball with your right foot. It is a nice long "sweep" or "swoosh" of the ball out into the direction of the throw.

Those who initiate the entry or first turn with the heel/toe turn as the ball passes in front of them at the end of the second wind can have a tendency to "turn inside the orbit" of the ball. Their body can get ahead of the ball and they end up dragging the ball around for the whole throw. The cue of **"see the ball"** means generally that you want your body mass aligned with where the ball is; however, remember not to have your eyes fixated on the actual ball and get yourself bent over as mentioned above.

The next Norlen cue is to forget about the footwork and **"send the ball by"** to at least off your left shoulder (90°) and let the ball **"pull you into the turn"**. You will find your feet automatically going into a heel/toe turn and you find yourself able to easily "step to the ball", as the outward pull of the ball toward 180° will pull the right foot off the ground when it is time. At the entry and on subsequent turns, you want to keep the right foot down as long as possible in "double support" and then **"step to the ball"** very *quickly* at 180°. Your foot lands somewhere around 220°; thus, you have minimized the amount of time you were on one foot or single support. You want to actually "see the ball" with your body at 180° degrees and be relaxed enough to have a focal point out in the distance (tree, fence post, etc.) with your vision to know you are at 180°.

Key Point: **Right Foot Lift Off and Plant** Some coaches encourage an early lift off (you see the foot off the ground by 90°) to make sure you get it down in time for a long double support phase where you can "work the ball". I favor the camp that tries to maximize the speed you added from the top of the turn down through 0° into the next turn—stay in double support as long as you can, feel the force of the ball pulling the foot off (120°-130°), and step lightning quick over the left foot instep (late lift/quick plant).

Keeping the right knee close to the left (closing the gap) will help you with a quick step, regardless of timing on the lift off of the right foot.

Key Point: **Counting the Turns** Many throwers count the start of each turning motion or pushing of the ball at the back of the circle (1…2…3..). Here is another method of counting that gets you focused on the main event of the throw—out into the sector. As you step to the ball, the hammer is at the top of its orbit (pointing out into the sector) and it is called **"the catch"** of the hammer. Counting the plant of the right foot as "one" will help you get focused on 180° and the importance of the quick step and set-up for the rest of the turn and throw.

From that **fly-casting metaphor** of the pendulum gravity drop of the ball (from 180° down through 0°) and on back out to 180° with the quick step of the right foot, you are patterning the release of the throw out into the sector. Togher and Deal, then, would "count" a 4-turn throw as "five throws" of the ball to 180° (turns 1-4 & release). I looked pretty silly and kept taking 5 actual turns when first trying this; but if you can orient yourself to 180° and the catch of the hammer as the "count" for each turn, it may help you do a better job in this critical part of the throw and keep you from over-rotating on your turns.

Key Point: **Constant Knee Angle of Turning Axis** Once you "enter" the throw, the knee angle of the turning axis leg (left leg for right-handed thrower) should be "locked in" for the remainder of the turns—there should not be any up and down movement with that leg. [Advanced throwers that "appear" on video clips to purposely drop the left knee lower at the "catch" in reality have a lower left hip countering the ball that is caused by the right knee/foot aggressively moving toward the ball in single support.] It is also important to fight the tendency to stand up on the left leg that will cause you to do a toe turn with both feet and then get you off balance. Also note, that if you over rotate on the entry, you will tend to subsequently do toe turns and be aligned for throwing the ball into the cage or out of the sector.

Key Point: **Four-Turn Entry** Four-turn throwers often initiate the entry with a toe turn to create space inside the circle to complete four rotations, but turns 2 through 4 are heel/toe turns. To use 4 heel/toe turns like elite thrower Tibor Gecsek, you will need relatively smaller feet and/or tight footwork in the turns.

The Turns

When you "catch" the ball at the top of Turn 1 (i.e., top or high point of the ball's orbit at 180°) as you "step to the ball" that **right foot is pressed down into the circle** (not just tapping down as you go around) touching down somewhere between 180° to 220°. Then, you counter the speed you just put on the ball with the entry into the turn as you **immediately shift your hips/butt behind your feet**. The right leg drives and the right arm sort of **"sweeps the ball"** around to 0° at the back of the circle and on around again to 180°; and you take another quick step to the ball. It is important to **feel the "ball speed" move around you** (the tetherball pole metaphor) and "send it by" into the next turn and out to 180°. This is the "main event" in the hammer.

Key Point: **Make It a Linear Event** The key to the hammer (like breaking down the rotation of the full discus movement into line and wheel drills and ½ & ¾ throws) is to make it a linear 180-to-180 event, rather than a circular one, i.e., you are simply walking towards the back of the circle rather than spinning around.

Key Point: **How to Counter the Ball** Notice that you are using your body weight to counter the hammer **naturally** in a gradual lean against the increased outward pull of the ball. The more you lean, the faster the ball moves around you (remember ball speed not body speed is the key distance variable), and the more you then have to lean back against the ball to keep up with its speed. Remember from above that you are not leaning backward at the waist, rather you are positioning the hips/butt farther behind your heels which in turn places your back against the ball.

Key Point: **Generate Force from the Ground Upward** Earlier we talked about that "right side drive" where the right foot grinds or pushes like the free foot on the ground with a scooter or skateboard. If you start out throwing the hammer or weight with a 1 or 2 turn "grip it & rip it" mentality, you will most likely have a difficult time progressing far in the hammer. The key to being able to accelerate the hammer in the turns, in addition to the body countering the outward pull of the hammer (centrifugal force) is for the thrower to generate centripetal force from the ground up through his/her body and out into the hammer. The feeling and upward progression of force should be a "pivot": forefoot, ankle, knee, thigh, hip, obliques, then & only then, the arm pushing the ball. The grip it & rip it, weight room, muscle mania mentality uses the arms and does not engage all those other right side drive components to generate force. Conversely, this is why smaller throwers with great technique can compete with the big guys. The big guys that grasp this stuff throw really far.

The one ball **"walk-around" drill** A good drill for grasping the feeling of ball speed around you correctly applied by countering and generating force upward on the right side. Starting with the hammer on your right side on the ground, you assume your good posture then start turning around in little "pitty pat" steps with arms extended to give you some momentum. After 2 or 3 turns start a heel/toe turn and go into successive turns. Really concentrate on sitting against the ball more and more just after the catch in each turn and feel the acceleration of the hammer around you back around to 180 just by counterbalancing the ball. Unless you are really big and strong, you will find better success by learning this countering concept and the feeling of the ball speed moving around you. As you add force generation from the ground upward, you will feel even more acceleration. Also, to establish rhythm with this drill, after several walk-arounds, you start the heel/toe turn when the hammer is at 180° with your right foot pointing at 180°—this mimics that pendulum drop of the ball from the top of the 2nd wind and sweeping or casting motion into the entry.

Key Point: **"Do nothing in the first turn!"** This is the one consistent training journal entry made by Lance Deal during his competitive career. It simply refers to the concept that the entry and first turn is merely an "extension of the winds". It also says that even

though you know better, there is a tendency when the adrenaline is cranked up to wind faster and try to push the ball around hard in turn 1. Deal often refers to the many "paradoxes of hammer throwing"; one of these is that you have to "slow down to speed up". Next I will discuss acceleration and speed progression, but it cannot be overemphasized for the 3 & 4 turn thrower that you need to be smooth and under control with good rhythm in the 1st turn to generate the acceleration in the final turns and transfer force out into the ball at the release. Do not get caught in the trap of trying to push the ball around hard at the beginning. When you do this you just find yourself turning faster (inside the orbit of the ball) the more you push, but you won't necessarily get the extra distance you desire because you are unable to counter the increased force. Remember the faster the ball goes, the more force the ball has, and, thus, the more you have to lean/sit against the ball to counterbalance the increased force.

Key Point: **Learn to Turn** How and when do you add the next turn? This question often gets asked and here is the answer—before you need to! For example, the best way to stabilize your 2nd turn of a 2-turn throw is to throw some on 3 turns and pretty soon you won't even be thinking about that 2nd turn. On a concrete pad or your driveway or sidewalk, practice multiple turns with the walk-around drill and wind & turn drill. The only way you get used to turning is to turn; for most throwers the dizziness will go away and the balance will come. Repeat sets of multiple turns (10-30) are important for establishing fundamentals and rapidly progressing in the hammer. Lance Deal could do over 60 in a row and Ken Norlen could turn all the way around the perimeter of a basketball court—and do multiple sets!

Acceleration and Speed Progression.
You probably will notice that I have spent far more time with the winds and the first turn. The reason is that the correct body position, balance, rhythm, timing, and countering provide the foundation to "set up" the last two or three turns. Everybody wants to know how he or she can "go faster" or get "more speed" with the hammer.

Key Point: **Gradually Build Speed** In reality, you can't just turn on the turbo jet boost or find some extra gear. Ironically, in an event where "speed kills", it is a gradual countering and speed progression using that same sweeping motion from 180° to 180° that you did at the catch in turn 1. For a 2-turner with the hammer, especially with some size and/or strength, you can accelerate the ball in 1 1/2 turns--turn 2 & the release. The 3-turner simply uses the first turn as an extension of the winds and only really accelerates hard for 2.5 times—turns 2, 3, & release. The top 4-turn throwers generally use a 2 + 2 pattern where they use the first two turns to **"set up the acceleration"** in turns 3, 4, & release. In effect, they put the accelerator to the floor by increased countering and more forceful & faster right side drive in the last couple of turns.

Key Point: **Orbit Plane Angle** The plane of the hammer's orbit about the thrower should also increase in angle as a consequence of a good low & high point in the orbit and the gradual buildup in speed progression. If it stays relatively flat, you are not building speed; if it gets too steep too soon, your entry orbit needs to flatten out.

Key Point: **Be Able to Turn Fast Under Control** I mentioned earlier that the Eastern European throwers learn to throw far with lighter implements then graduate to heavier implements and weight training. Even the world class hammer throwers throw with lighter implements. If you can't turn fast under control with a lighter implement, you certainly cannot with a heavier one. However, the key is to hit the correct positions and use proper technique and not revert to muscling the implement simply because it feels lighter. Doing two-ball "gyros" or one-ball walk around drills at fast speeds can help groove those neuromuscular pathways for going fast.

The Release or Finish

As you catch the ball at the top of your last turn, you pretty much just hold on and do that sweeping action with the whole right side/arm (not a pull with the left) out around the left and **up and out** into the sector. You **anticipate** the ball coming to zero in front where you stand up ramrod straight with the **head back** (getting the head back **will lift the chest**) and **arms lifting**. The key on the release is to keep on doing another ¼ heel/toe turn, so that you are throwing around the left leg block to 180° and not just throwing it over your shoulder like a sack of potatoes.

I prefer the term "finish" over "release" because you should be just finishing the last of a series of "throws" around you out toward the sector—you simply release the last one. You should feel both arms come through the bottom in front of you and out into the sector. At actual release of the implement, if your left hand/arm ends up way off to the left or you end up with most of your weight on the left side and falling away, then you are pulling on the ball—ironically you will take momentum off the ball you just got through building up!

My Throw Cues

Aside from the concepts above, I will tell you what works for me in terms of cues during the actual throw. I follow a traditional 2+ 2 pattern as a 4-turn thrower. In my case I counter, counter (butt/hips behind heels), push, push (the ball with my right side from the ground upward). In competition, you can't think…you just do.

- I "do nothing in the first turn" except that nice smooth entry (fly fishing cast from 180° in 2nd wind out around to the sector), counter at the right foot step to the ball at 180° (**count "1**") and nice long sweep around back to 180°.

    - I verbally cue myself to **"run long"** meaning I am nice and long and moving the ball around the left side turning axis and out to 180°.

- At this point, I am at the top or catch of turn 2 (**count "2**"), I consciously counter the ball more by sitting back more while simultaneously driving hard with the right foot/leg (pivot) and pushing a little bit with the right forearm (push) on through zero and on back out to 180° (**count "3"**).

- So, what I have done until now is basically smoothly counter the ball and sweep the hammer around me feeling the ball speed in the first two turns.

- I then end up adding the push of the ball at the top of turn 2 (count "2") which accelerates me into turn 3 where I simply push a little harder (with the right forearm) while countering and it takes me into turn 4.

- At the top of 4 (**count "4"**) I do not have a mad dash to get to a power position for the release. I am just repeating what I did at the top of the previous two turns—pivoting & pushing with the right side a little harder each time, as I simultaneously counter with the hip/butt behind the heels and sweep the hammer to feel the ball speed around me.

  - My "turn counts" at the catch/top of turns is my verbal cue to myself for bringing the right forearm push into the throw....One, **TWO**, **THREE**, **FOUR**!! I count each turn to myself quicker and louder each turn to cue me to generate more force from the ground up & push the ball harder. The countering is a natural reaction to the outward pull of the ball.

- Do the stomp!! A real key for me in those last two turns is the ability to stay in double support as long as possible before stepping with the right foot (visually see 180°), and then, stomp the right foot down, drive the right leg (pivot) and push hard (with the right forearm).

- For the finish/release, I cue myself with **"UP!"** just as the ball hits the low point at 0° between my legs—this is my verbal "thrower's yell"—which helps me throw the ball up and out into the middle of the sector.

Improvement in the Hammer

Unlike golf where the duffer can become a decent bogie golfer with better clubs like the oversized woods and perimeter weighted & cavity back irons, as a hammer thrower, there is no secret weapon or magic elixir equipment or tips—you will have to do the equivalent of a lot time on the driving range, practice greens and get some lessons!! Most throwers need to be able understand the hammer physics, the technique fundamentals, obtain coaching, practice with drills and 50%-80% effort throws to ingrain the neuromuscular patterns, and then "find your throw".

By this I mean there are many different body types, athletic abilities, strength levels, and abilities to comprehend and emulate certain concepts. You have to be able to incorporate bits and pieces of this theory, imagery, and cues and find what works best for you. You will have found "your throw" when you are very consistent and have more good throws with balance and rhythm with most of them landing out in the sector.

One of the best practical things for the aspiring hammer thrower is videotaping your throws for self-analysis, comparison with throwing video clips available on the Internet, and sharing with others for their critique and input.

Epilogue

Throw far and have fun. Hammer throwing is a journey. I hope this road map helps. The goal like modern business is "continual process improvement". As Lance Deal says, "Take care of the technique and the distance will come!"