



## MIKE EPSTEIN HITTING, INC.

303-694-7700

<http://www.mikeepsteinhitting.com>

Copyright © Mike Epstein 2006

For publication by the National Fastpitch Coaches Association

### **Defining the Linear and Rotational Hitting Techniques for Fastpitch Softball**

As many of you already know, I played in the major leagues for nine years. In addition, I played for baseball's greatest hitter, Ted Williams, for three years and mentored under him for another ten. I received the *only* Letter of Recommendation he ever gave out for hitting instruction back in 1990. Believe me, I earned it. It was comparable to earning a PhD in both hitting and pitching instruction. He was tough, but without his consummate knowledge I would seemingly be just as "lost" about hitting as everyone else

We spent many days discussing the relative merits of both rotational and linear hitting. Despite being open-minded in our conversations about both techniques, it was difficult to dismiss the facts that 1) linear hitting almost put baseball "out of business" in the early 1900s ("Deadball Era"); 2) 95% of baseball's Hall-of-Fame hitters utilized the rotational technique, and 3) rotational hitting correctly makes use of ALL the laws of physics.

Whether our observations had merit or not, to me, is NOT the issue. The real question, in my mind, is when should one or the other be taught? In other words, both techniques are diametrically opposed and have different applications for different types of hitters. Be it softball or baseball.

Ted Williams asked me to carry on his legacy when he no longer was able. I embarked on his request in 2000. At that time, I had no intention of involving myself with fastpitch softball. I had a seemingly full plate in front of me just trying to convey to the *baseball* world that linear hitting was a "lunging" technique. And, EVERYONE knows lunging is counter-productive. Eventually, the baseball world began to see the logic in what I was

saying and the “Stay back” cue came into vogue. Today, knowledgeable coaches preach “stay back” to their hitters and have reaped the rewards for changing.

Over the past six years I have heard from many concerned fastpitch parents. They basically ask two questions. The first is, “Why does pitching dominate in softball?” My answer is quite simple and straightforward: “Because softball hitters allow them to dominate.” The second question is, “What is the difference between linear and rotational hitting?” I tell them that when a pitcher makes a “mistake” pitch to a linear hitter, she gives up a single. When she makes a mistake pitch to a rotational hitter, it’s three runs.

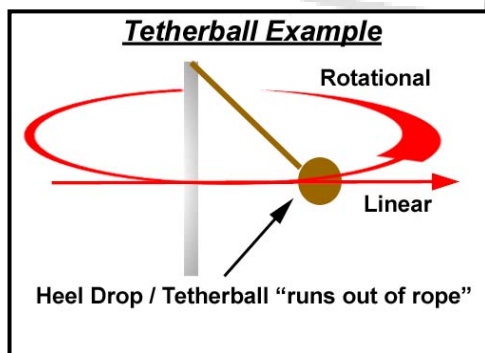
When I hear from softball coaches now it is usually a referral because their team got “waxed” in a tournament by teams with powerful offenses. The losing coach will ask the other team’s coach where his players learned to hit like “that.” Their response is, “Mike Epstein.”

### **Style and Technique**

To get an initial hold on this intriguing issue, it is necessary to define the words “style” and “technique.” Unfortunately, these words have been used interchangeably over the years. We hear people talking about players having their own “hitting styles.” I think this is confusing.

In reality, there are only TWO hitting systems: *linear* and *rotational*. Each system has its own set of “laws” which govern their physical movements. For this reason, *they should not be combined*.

However, one “shared” movement is the *weight transfer*. In linear hitting, the weight begins coming forward in the stride and *continues* coming forward through contact and follow-through. In other words, the hitter’s weight is one continuous movement towards the oncoming pitch.



In rotational hitting, there is *also* a weight transfer forward in the stride, but once the front heel drops to trigger the swing, the front side is *blocked* and the hitter’s linear movement becomes rotational. One must remember that when the front foot plants, it blocks the front side and the linear movement that was initiated in the

stride. Body momentum at this point revolves around a stationary axis, precluding lunging, much like the tetherball example I use in my teaching DVDs and the illustration you see here.

If we throw a tetherball as hard as we can, it rapidly passes the pole it is tethered to. But when the tetherball “runs out of rope,” it violently rotates around the pole it is attached to.

Thus, we can graphically see the transition from linear to rotational. Dropping the front heel is *one* of the keys for blocking the weight transfer. This movement is comparable to the tetherball when it “runs out of rope.” Both turn linear movement into rotational (angular) energy.

There are many out there today that preach a “hybrid” swing; the weight moves in a linear fashion and then rotates. It is wise NOT to be confused here; this IS rotational hitting! For reasons unknown to me, some softball coaches are trying to take credit for something “new” and are re-packaging rotational hitting to be something “different.” The “linear move” they describe is the stride, a natural response to breaking inertia that also precipitates the beginning of the torquing process. Rotational hitting has *always* incorporated a linear weight transfer before transitioning to rotational energy!

Today, we instruct our hitters to “stay back,” ostensibly because — whether we realize it or not — we are making an attempt to teach rotational hitting! I don’t know why this is, but coaches will try to teach concepts which they are not totally familiar with, simply because it is the “rage.” And today, “staying back” is THE rage.

However, I am (and you should be) continually amazed by softball coaches who passionately argue their undying belief in linear hitting as the ONLY technique for fastpitch hitters. Many of these same coaches also teach their hitters to “stay back.” Yet, by definition, *linear hitting is moving forward*, transferring the hitter’s weight from over their back leg to over their front leg in one continuous forward movement. *Say what?*

How is it possible to stay back and be linear at the same time? No wonder hitters are confused. The hitters are – because the coaches are. Many softball “gurus” are now teaching a “hybrid” swing to their hitters, clinging to what they used to teach (linear) with the inevitable changeover to rotational hitting that is taking place.

While it *may* be possible to combine both hitting systems, my personal experience has revealed that it is restraining for even the elite athlete. Over the years, linear hitting has produced singles and contact hitters, while rotational hitters have been the power hitters and run producers. Good softball lineups often have a blend of both “table setters” (linear) and “run producers” (rotational).

We must have command of our knowledge if we are to have a positive effect on those with whom we communicate.

## **Style**

Style *is* the player. Style is what distinguishes a hitter from everyone else. Style is *personal*. A number of years ago at an Oakland A’s Old Timers’ game, Vida Blue, Catfish Hunter, Reggie Jackson, and I were standing against the left-centerfield fence. We were laughing and telling “war stories” when a very heavy player on the “opposing” team stepped into the batting cage to hit. “Who’s that?” asked Vida. None of us

recognized the overweight player. Then, as he knocked some dirt out of his spikes, in unison, we said, “Danny Cater!” Although we couldn’t see his face and his body had changed dramatically, his mannerisms (style) told us all we needed to know.

We all have our own personal styles that allow us to do things as effortlessly and as comfortably as possible. We’ve all recognized people by the way they walk when we weren’t close enough to really “see” them.

Hitters utilize their personal styles to get their bodies into advantaged hitting positions. All the pre-swing movements they make should be executed as relaxed as possible. Some are “quiet” hitters, some have wide stances, some have deep crouches, and some have their hands high. When I tell a hitter to be “comfortable,” I’m really talking about his personal style. The goal is to be “tension-free.”

While it’s not a good idea to try to change a hitter’s style, softball coaches are notorious for “cloning” their hitters to look alike. The *hitter* should be the one who initiates the changes, which are normally done through routine adjustments and trial-and-error. NOT the coach. A hitter’s style *must* allow her to get to the universal launch position (the top of the top hand at the bottom of her armpit), tension-free and *on time*. If this is not possible, then adjustments must be made. Otherwise, it’s a matter of personal comfort.

## Technique

On the other hand, we have “technique.” Technique is not personal. Technique is *universal*, with 95% of baseball’s Hall of Fame hitters using the *same* technique. Over the past century, baseball’s productive (high OPS) players have hit this way.

Ultimately, *the player’s personal style will “wrap around” her universal technique.* “Style” is why hitters (should) all “look” different, but resort to the same core movements from launch to contact. They all have different styles, but the technique remains constant. What’s made it so difficult to see is technique happens in milliseconds and often goes unnoticed.

*The hitter’s technique represents the movements that must be emulated! Not their style.* Softball coaches need to grasp this concept, because over the years all they have done is “clone” hitters to the extent that they all look alike from stance to follow-through (including bashing their upper arm as they finish their swings!).

The Epstein Teaching System™ focuses on proprietary drills to “burn in” the muscle memory required to perform this time-proven hitting technique.

Once a hitter masters the technique, the only adjustments they will make as she continues playing are “style” adjustments.

Understanding these terms is a good first step in taking the confusion out of the teaching process.

The rest of this article will concern itself with rotational hitting for those not familiar with it.

### ***How rotational hitting works***

Rotational hitting is a biomechanically correct sequence of events designed to hit a ball *hard*. Its effectiveness relies on the kinetic energy developed through the separation of the upper and lower torsos. I describe this vital movement as “torque.” The scientific definition is the “kinetic link” which promotes “kinetic chaining.” “Kinetic energy” is produced as the swing uncoils.

Kinetic energy *always* works “upward,” and the rotational baseball swing is no exception. It starts in the feet and works its way up as the body rotates around a stationary axis. It continues out the shoulders, out the arms and hands, and releases its total accumulated energy at the end of the bat. For those of you who are golfers, you know what I am talking about (“X Factor”). If kinetic energy works upward in physical movement, why do we teach hitters to swing “down?”

In the final analysis, rotational hitting is a finely-honed *system of pulleys and levers* that effectuate the *equal and opposite* principle of physics to maximize kinetic energy.

It is the *only* hitting technique capable of delivering and optimizing high kinetic energy, and is the principal reason why it has been used over the past century by 95% of baseball’s Hall-of-Fame hitters. Linear hitting does not produce kinetic energy because linear hitters don’t rotate and therefore don’t produce torque.

### ***Hitting types***

To further simplify the teaching process, hitters must be classified into three distinct groups. *All* hitters are different. They have different abilities, sizes, and strengths. For this reason alone they must have different hitting approaches.

The reason so many hitters fail is because we instruct them to all hit the same way. Big, small, weak, strong, fast and slow – they are all taught the same. We teach all softball hitters that “ground balls are good.” Are ground balls really “good” for a big, strong player who has absolutely no foot speed?

Can you see why so many become disillusioned and fail? By cloning hitters and making them all do the same thing, we have inadvertently made soccer the fastest growing sport in this country.

### ***Classifying hitters***

To overcome this teaching anomaly, I classify hitters into three distinct types. All hitters fall into one of these three groups:

- Singles/contact

- Line/drive gap
- Pure power

### **The Singles/Contact Hitter**

The primary goal of the singles/contact hitter should be low line drives and ground balls. This type is the prototypical linear hitter. In softball, many are “slap hitters.”

- Characteristics
  - Excellent foot speed
  - They can take advantage of the ground ball
  - Little or no power
  - Hitting the ball in the air doesn’t make much sense
  - Position on “axis”: *Upright* (Results in a flatter swing plane than the other two hitting types)
- Goals
  - 50% *low* line drives and 50% ground balls
  - Ground balls to take advantage of their great foot speed
  - High on-base percentage
  - “Table setter”

(Unfortunately, I see far too many softball hitters who have been made into Singles/Contact hitters *despite their ability to do much more*. Talent and ability are heartbreaking things to waste through poor coaching and/or information.)

### **The Line-Drive/Gap Hitter**

The goal of the line drive/gap hitter is to “balance out” their off-the-bat ball trajectories. Some have more power potential than others and this advantage must be developed by the instructor.

- Characteristics
  - “Average” to “good” foot speed
  - “Average” to “good” power
  - Position on “axis”: slightly *behind* center
  - Has slightly steeper swing plane than the Singles/Contact hitter

- Goals
  - 50% *high* line drives, 25% fly balls and 25% ground balls
  - High total bases and high slugging percentage

## The Pure Power Hitter

The goal of the Pure Power hitter is big-time production.

- Characteristics
  - Great power and/or size
  - Little (if any) foot speed
  - Position on “axis”: *Further back* than the Line-Drive gap hitter
  - Needs to get the ball in the air more often to be effective
  - Ground balls to them result in too many outs

- Goals
  - 50% *high* line drives and 50% fly balls
  - Home runs, high slugging percentage, high total bases, high on-base percentage, and RBIs

So, while *each hitter should demonstrate the identical core mechanics*, their position relative to their axis normally determines the *type* of hitter they are (or will become).

(It is interesting to note that, as a “general” rule, *all* hitting types become “Singles/Contact hitters” with two strikes. *Contact — not power — becomes the goal with two strikes.*)

We should now be at the common understanding that the defining characteristic of each hitter’s type boils down to *where they position themselves relative to their axis of rotation*. The technique is identical for all three types.

### **The “Knee is the Key”**

This may shock you, but in reality, there really isn’t any “uppercutting” at all in the good rotational swing! I guess there *could* be if one wasn’t taught to hit correctly or if someone was absolutely determined to do it. But, those that swing up *too* much often make early departures from the game, as do those who swing down *too* much.

The whole idea behind the proper swing is to get the hitter to “match the plane of their swing to the plane of the pitch.” This is a dynamic moment in the rotational swing that allows the hitter to maximize his contact area.

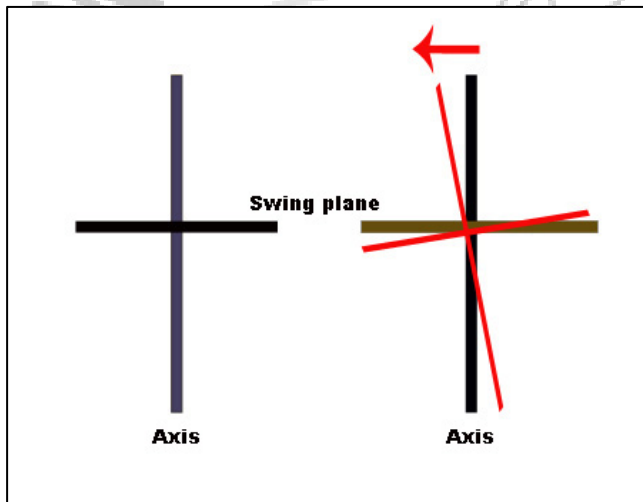
Contrary to “popular” belief, this is *not* a result of swinging “up.” It is a product of *hinging* the rear knee, which induces a “tilting” process that the hitter’s body undergoes at the swing’s launch point.

Viewing the diagram of the “open view” of a right hand hitter (i.e., the direction of the pitch is from right to left), the horizontal lines represent a “level” (to the ground) swing. The vertical lines represent the hitter’s axis.

By “hinging” the rear knee (i.e., compressing or “sitting on it”), the hitter is able to tilt rearward, behind their axis. *The more the knee hinges, the greater the tilt and the steeper the swing gradient.*

It should now be clear how a hitter, taught sensible mechanics, is able to make the on-the-fly adjustment to the pitch they get to be successful. *Hinging the rear knee is a swing dynamic in response to the pitch the hitter gets.*

As I stated before, there really is no “uppercut” to the swing. The offset lines in the figure show the result of hinging the back knee. *The “swing” line and “axis” line have not changed their relationship and are still perpendicular to one another.*



The swing is still “level.” However, now it is “level to the ball,” not “level to the ground.” In other words, the difference is the hitter is now swinging on the same plane as the oncoming pitch.

### **“Weathervaning”**

Another swing dynamic involves the hitter’s lead elbow.

The hinging of the rear knee shapes the posture of the hitter’s body and

determines the “rough” swing plane it will initially take.

“Weathervaning” is a term I use to describe the process of “fine-tuning” the plane of the swing to further match the plane of the pitch.

The rotational hitting technique allows the hitter to make instinctive, rapid-fire, on-the-fly adjustments to an incoming pitch. It is why I say, “The perfect swing is the adjustment the hitter makes to the pitch they get.”

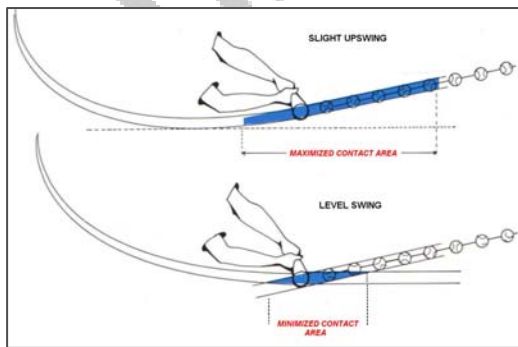
The majority of fastpitch hitters are taught to swing “one way” (e.g., “down”). This takes away from their ability to work on the same plane as the pitch. When the hitter is able to match the plane of their swing to the plane of the pitch, her lead elbow works in an

approximate 6" slot. If the pitch is perceived as "down," the lead elbow responsively works "up" in the slot. If the pitch is perceived as "up," the lead elbow adjusts and works down. This oscillating movement, or "weathervaning," of the lead elbow permits this to happen. The rotational swing is all about the ability to make these dynamic adjustments.

Pitchers are taught to throw in a "downhill plane" because it's much tougher for the hitter to lift the ball and do some real damage. Because we don't teach softball hitters to counteract a pitcher's strategy, hitters have allowed pitchers to dominate in fastpitch. It will continue this way until hitters are taught to adjust to different pitches.

If a pitch is perceived as "down," and the hitter has been taught to swing with their lead elbow "down," the likely result is a ground ball.

If the pitch is perceived as "up" the lead elbow will routinely make an adjustment and work down in the slot, flattening out the swing, and putting the bat in perfect alignment with the ball.



Another reason for the weathervaning lead elbow is to maximize the hitter's contact area. If a player can't do this and their movement is linear, producing a downward or "level to the ground" plane to their swing, they have only one chance to hit the ball as the planes of the swing and pitch converge.

This small area of a few inches leaves little room for timing error. Contrast this to the previous example of weathervaning that produces a contact area of approximately 30" or more.

Further, if a hitter matches the plane of the swing to the plane of the pitch, and is a little late, she will hit the *bottom-half* of the ball, producing *backspin*, which gives a ball hit in the air more distance.

If she's a little early, she'll hit the *top-half* of the ball and produce *over spin*, exactly what hitters want on ground balls. Ground balls with over spin *pick up momentum* as they travel, producing "bad hops" and getting by infielders too quickly for them to make a play.

Matching the plane of the swing to the plane of the pitch gives the hitter the best of all worlds! Hitters can be taught to make this mechanical adjustment. The player's inherent ability and the "plan" they take to the plate, however, will dictate its consistency. It all starts with the right technique.

It has been argued that the plane of the softball pitch is flatter than the plane of the baseball pitch and therefore a down to level swing is preferred. This argument does have some validity, but the fact of the matter is the hitter *still* must reposition herself behind

the axis (“body tilt”) on pitches at her knees (regardless of the degree of “pitch tilt”) to be effective and not simply hit ground balls. In other words, the hitter “tilts” to counteract the pitch “tilt.”

Since all softball pitches (fastballs, drops, curves, changeups) sink and are going “down” when passing the hitter (yes, even the “rise ball” by virtue of gravity), common sense should dictate that a hitter should counteract this by matching her swing plane to the pitch plane.

With rotational hitters, the lower the pitch, the steeper the swing planes. Conversely, the higher the pitch, the flatter the swing plane. The last thing a hitter should want is to “swing down at a pitch going down.” If they do, they help the pitcher become a winner.

I was listening to a high school fastpitch coach who was talking to her pitchers about the merits of *throwing* ground balls. Twenty minutes later, she walked over to her position players and worked with them on *hitting* ground balls.

Why would anyone teach hitters to do exactly what pitchers want them to do?

### **Stay “inside” the ball**

We also hear coaches and parents telling hitters to stay “inside” the ball. Far too many simply parrot this information and don’t explain it, leaving hitters to try to figure it out for themselves. My experience is that it doesn’t get explained because most do not know what it means.

The correct definition of staying “inside” the ball is “the hands follow the rotating body around its axis.”

Even with the correct definition in hand, the overriding problem is it is virtually impossible for the linear hitter to stay “inside” the ball. Their body (and swing) goes from back to front and doesn’t rotate! Over the years we have bred a generation of linear hitters who all hit “around” the ball because their mechanics made it impossible to do otherwise.

In spite of this linear swing “deficiency,” coaches and parents still exhort linear hitters to stay “inside” the ball without realizing how frustrating this is for the linear hitter to comply with. Rotational hitters do not have this problem. Their hands work in a circular path as they follow their rotating bodies around their axes.

Staying “inside” the ball keeps the swing compact, enables the hitter to be short to the ball, allows hitters to keep “inside” pitches “fair” and allows them to swing a slightly longer and slightly heavier bat for added momentum and leverage. An added plus is rotational hitters excel at situational hitting because of their ability to hit either ground balls, fly balls, or line drives.

*When potential is the goal, knowledge is a must.* This not only applies to hitters, but to coaches and instructors as well.

## **Pros and Cons**

Make no mistake here; neither technique is “perfect.” Each system has its own arguments or considerations for and against their use. As I stated earlier, the wise instructor matches what she knows to the particular hitter she is tutoring. I have found that the linear technique may work best for the Singles/Contact type hitter while the rotational technique has worked best for the line Drive/Gap and Pure Power types. The key here is to have the information and teaching knowledge to offer the hitter a choice, one that caters to *her* particular body type and genetic abilities. Otherwise, we would see FedEx trucks entering the Indianapolis 500 and Corvettes delivering packages!

To me, nothing is worse than a hitter with little size and/or strength who hits mostly fly balls. There’s certainly little future in that. However, it is equally distasteful for me to see a hitter that *does* have the size and/or strength to *not* hit the majority of pitches in the air, because she has been taught to pound pitches into the ground. There’s little future for that type hitter, also.

## **Common questions**

Let’s face it. Hitters hit pitchers’ mistakes. When a pitcher makes good pitches and has good “stuff,” that day, it’s going to be frustrating for a lot of hitters. No matter whether the hitter is linear or rotational. However, pitchers make mistakes. Lots of them. The key is for the hitter to take advantage of these mistakes. Much depends on the hitter’s technique and being able to make adjustments.

For this reason, I am amazed by all the softball coaches who ask questions like, “How do rotational hitters hit the low-outside pitch” or “How do rotational hitters hit the pitch up?” How? As explained earlier, they make adjustments to the pitch location. Because they can!

Hitting the low outside pitch: Pitchers throw to this area because it is harder to make contact (further away from the eyes) and more difficult to generate power. The hitter must wait longer in order to hit the outside pitch deeper in her contact zone, thus generating a length of stroke that is too short (bringing about less momentum). Additionally, because pitches thrown down in the zone “sink,” it makes it much more difficult for a hitter swinging down or level to hit it. If they do hit it, very little “damage” results.

Linear hitters are taught to come forward to hit the low outside pitch, but in so doing, the lead knee flexes to accommodate this movement, and lunging ensues. The result is normally a ground ball to an offside infielder

Rotational hitters are taught to tilt rearward more to swing level to the ball. When executed correctly by the hitter, assuming the timing is correct (she has let the ball get deeper to accommodate the pitch location), a line drive is normally generated.

Do rotational hitters hit the outside pitch? Of course they do. Not as well as they hit the pitch three-quarters of the plate “in.” To hit the outside pitch they let the ball get deep. I often hear fastpitch coaches tell hitters that rotational hitters don’t/can’t hit the outside pitch. If they couldn’t, 95% of baseball’s Hall-of-Fame hitters would have failed, because whether it’s softball or baseball, throwing the low outside pitch (for strikes) is a pitcher’s ticket to success. Another of Williams’ brilliant statements on hitting was, “History is made on the inside-half of the plate.” Because to hit this pitch, the hitter *must* hit the pitch out in front of their lead knee (instead of the back hip on an outside pitch). Now the hitter has maximized her length of stroke and momentum. This results in greater bat speed and power.

The blatant truth is very few hitters are successful if the pitcher is “on” that day and consistently making tough pitches on the outside corner. No matter which technique the hitter uses. Mistakes are a hitter’s best friend.

Hitting the inside pitch: When pitchers make mistakes, they are generally made in two areas: “in” and “up.” In my experience, for a hitter to be successful, she must be able to “jump on” these mistakes. But what if what we teach hitters keeps them from hitting these pitches? If so, we have unintentionally limited a hitter’s chances for success. If a pitcher is able to hit the inside corner *consistently*, few hitters will be successful. But, if she misses by an inch or so out over the plate, LOOK OUT! A rotational hitter will crush the pitch because of their technique. A linear hitter will probably get jammed because she doesn’t rotate and therefore doesn’t stay inside the ball.

Hitting the high pitch: High pitches are a pitcher’s nightmare because they have already given the hitter the elevation she needs to hit the ball a long way. In other words, it is much easier to do damage with a pitch in this area. While it would appear that a high pitch would favor a linear hitter because of her level or down swing, the fact still remains that pitchers are not taught to throw there. Fastpitch pitchers are taught to throw at the knees, so having a “grooved” swing that is level to the ground makes hitting tough if that is where the majority of pitches are thrown. If this is the case, and most pitches are thrown low (knees), how does she hit a pitch in that location with a level swing?

Hitting the “rise” ball: This pitch “troubles” every fastpitch hitter we instruct. It seems they are petrified by it! In reality, the rise ball is no different than baseball’s “split finger” pitch. They are similar because they are “chase pitches” and not intended to be thrown for strikes. If they *are* thrown for strikes, they are usually a “mistake” and become good pitches to hit. Rise balls are customarily thrown when the hitter is behind in the count or has two strikes. Moreover, these pitches are not thrown as hard as “drops” or fastballs. So if the hitter is predisposed to coming forward (linear), it is difficult to brake their forward

movement. Pitchers change speeds to fool the hitter and get her on her front foot. I would advise against a technique that promotes the hitter doing what the pitcher is trying to get them to do!

IF the hitter is facing a pitcher that day whose rise ball is one of her effective pitches and she will throw it at any time and in any count situation, then the hitter can “look” for it (anticipate) with less than two strikes. To hit it, she must consciously level out her swing by staying more upright on the axis and leveling out her shoulders in order to be level to the ball.

No major league hitter looks for Roger Clemens splitter unless their back is to the wall (two strikes). If Clemens wants to throw it with less than two strikes, so be it. They won't swing; it's too difficult to hit. Softball hitters must learn to think like a pitcher when they are hitting. If they don't, neither linear nor rotational hitting mechanics will help.

### ***The “best” technique***

Which technique is right? The “best” technique is one which takes advantage of an individual hitter's innate capabilities. In other words, “cloning” each hitter regardless of hitting types makes for hitters losing interest in the game. Coaches should adjust what they teach their hitters to best take advantage of their special assets, whether it is the rotational or linear technique.

By doing so, everyone comes out ahead. The coach fields a strong offensive team and the individual players have “fun.” And, the truth is I've never known a hitter that had “fun” hitting .150.

Why make a tough thing like hitting—tougher?

Good luck, continued success, and “get a good pitch to hit!”

*Ulrich Spolten*