

# Youth Baseball Pitching: Teaching Proper Mechanics Critical

By John Pinkman  
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## Teaching how not to pitch

Twenty or thirty years ago, most pitchers in youth baseball were not being taught how to pitch correctly. Rather, they were taught how *not* to pitch; what some coach suspected they were doing wrong (I say, "suspected," because few coaches took the time to learn how to teach pitching).

Unfortunately, not too much has changed.

Instead of trying to identify the reasons so many young pitchers are injuring their throwing elbows and shoulders, the focus has been on the symptoms of the problem and implementing guesswork measures in that hopes that one might work.

To me, it makes a whole lot more sense to first figure out what the problem is and then come up with solutions to fix that problem. So, for the last 20 years or so, I have been preaching and teaching a different approach to pitching, one designed to prevent pitching injuries from occurring in the first place by teaching proper pitching mechanics.

## Fact versus opinion

Even in today's youth baseball there are still many well intentioned "pitching coaches" whose only qualification for the job is that they themselves pitched at some time in the past. They remember they were sometimes successful and sometimes not, but most never knew why.

If your child is a pitcher, the most important thing for him to know is the relationship between cause and effect that explains why some pitchers succeed, and why some fail, why some get injured, and some don't. The only way to do that is through video analysis. It shows you "WHY!"

Pitchers are smart. They are drawn to the position by their intellect as well as their athleticism. Today's pitchers learn quickly if you can provide them with reasonable (the ability to reason) information.



Just as any other kinetic motion, pitching has numerous components which can be broken down into teachable parts. Pitchers need patience, persistence and video analysis to truly learn what is currently happening. Coaches need a plan.

Then why don't all coaches use video analysis to teach? Video exposes ignorance and incompetence. You really have to know your stuff to analyze video, you can't fake it. The reviewer must know about current research and historical patterns, and constantly be sensitive to communication techniques that inform, instruct, and inspire a student and his family in a positive manner. It is all about information retention values. For a very long time, the staff at the Pinkman Baseball Academy and I have reviewed 1500 to 2000 videos a year.

## Stopping the madness

Chances are, though, unless your child has trained with a teaching professional or coach who has learned the biomechanics of pitching in the last 10 years, what he is likely to be taught is probably going to be based, not on scientific fact and research, but on the coach's personal opinion about the flaws in his pitching mechanics. Teaching professionals and great coaches are always willing and eager to answer the question, "what have you read lately?"

The sad truth is that, despite the amazing advances in computer technology and medicine, the younger the pitcher, the more likely they will fail to develop their pitching skills and risk injury as a result of coaching ignorance, negligence, or competitive greed!

Just one recent example proves my point. During the third week of March 2010, after three record snowfalls in February and weeks of rain, I received a call from an emotional parent. The dad told us that his 12-year-old son threw 39 pitches the previous Saturday and 120 pitches the next day. Why? It was a tournament!

This is the type of coaching insanity that has to stop. Whether ignorance or abuse, it simply has to stop. A 12-year-old throwing that many pitches in mid-June would be very wrong and harmful to the child; that he did so at the beginning of the season in March was sheer madness. He was just a kid. But his team really, really needed to win that early March tournament!

Need proof? Well, then, consider the fact that during that same weekend at the Washington Nationals' spring training camp, Seven Strasburg, then a rookie who reached 100 miles per hour on the radar gun, had a *forty pitch count limit!* He threw 27 pitches in two innings, then went to the bull pen to throw the final 13.

As a professional pitcher, Strasburg benefits from the best medical and strength training money can buy. After all, the team knows it has significant investment in the young man and, naturally, it wants not only to protect that investment but get a return. Strasburg was paid \$1.8 million that year, but went on the disabled list after two major league starts, and in his third start back from the DL in August 2010, tore his ulnar collateral ligament, requiring [Tommy John surgery](#) <sup>[1]</sup> and 18 months of rehab. The likely cause of the injury, as a recent [ESPN: The Magazine article](#) <sup>[2]</sup> discusses in depth, was Strasberg's poor pitching mechanics (arm lag and improper sequencing), which put his shoulder and elbow under extra stress; flaws which have not been corrected and lead some biomechanical experts to believe that Strasburg, who has yet to make it through a full major league season, never will.

Still not convinced? How about some before and after photos? Here are photos sent by a college coach of one of our students after the surgery. The picture on the left is the result of years of improper to bizarre mechanics; but he was successful. I hope this puts to rest the tired Industrial Age quote, "if it ain't broke - don't fix it."

The xrays show the left humerus bone. The complete break is just above the elbow from enormous improper torque resulting from incorrect throwing mechanics:



## Arming parents

*Parents must have greater expectations of coaches at all levels, period.*

Yes, you can say I have seen it all, over several generations. This is why I am so passionate about teaching. One of the best ways to protect against arm injuries and maximize your child's natural ability is to **teach proper pitching mechanics at as early an age as possible**.

- **Learn about pitching even if you aren't a coach.** As a result, even if you aren't coaching your child's youth baseball or Little League team, learning the basic principles of pitching, as taught by the best instructors in the country, is a good idea.
- **Learning about pitching mechanics doesn't need to be complicated.** Teaching your child about pitching mechanics doesn't need to be complicated, and it doesn't need to be too technical.
- **No shortcuts or quick fixes.** You and your child do, however, have to be willing to commit enough time to understand the entire process, step by step. As I know from years of teaching pitching at my baseball academy, players who come expecting a "quick fix", who believe that we can wave a magic wand over their heads that will give them the ability to throw a one-hit shutout every time they take the mound almost always end up leaving disappointed.

## Tail wags dog

For years youth baseball leagues around the country have asked me to teach pitching clinics. When I give them a proposal calling for six hours of instruction, the usual response I get is, "My God! We can't do that. The coaches won't stay that long! We have to keep it down to an hour, two at the most."

What they want is for the tail to wag the proverbial dog: They can't afford the time for education or actual learning; they want the warm and fuzzy appearance of training. The result, not surprisingly, is that their teams continue to lose in post season play and they scratch their heads and wonder why. They actually know why, of course, but they would rather complain about a lack of talent in the league and wait in the vain hope that a genetic wave of talent will pass through town.

The same is true at the high school level, where, pitching depth, as it is at all levels of baseball, is critical to success in post-season play. Players across the country tell me there is an unbelievable lack of instruction at both the pitcher and catcher positions in high school.

## Throwing straight before throwing crooked

- **Pitching is a sequence of events.** The complete pitching motion is a sequence of events, with a very clear start, specific critical moments along the way, and a finite end. It is only as good as the weakest link in the chain.
- **Mental preparation before pitch required.** Before the pitcher even begins his pitching motion, he needs to be mentally prepared (since I'm focusing here on pitching mechanics, I'll leave that subject for another article).
- **Throwing sequence same regardless of position.** Regardless of whether your child is a pitcher or playing another position on the diamond, the throwing process involves an **efficient transfer of energy** during the throwing motion from the player's feet into the ball. A perfect throw is one in which all of the player's kinetic energy ends up being transferred to the ball. If any one part of that energy transfer system is less efficient than the others, the entire system, and velocity and accuracy suffer.
- **All about body control and balance:** Learning the pitching motion is primarily about body control, not about the arm. Balance will determine accuracy. Imagine holding a hose with running water. Pinch any section - at the faucet, in the middle, or just before the nozzle. The same result will occur - less water will come out the end.
- **Accuracy, not velocity.** The goal is not velocity. It is accuracy. Nothing is as boring in sports as watching a youngster walk 5 batters in a row. This is precisely why I became a pitching coach 20 years ago. I wanted to do something in baseball that would have the greatest impact. Teaching children to throw straight is where I began. You can do it too! Whether you call it location or "command", there is a simple truth that you learn after training thousands of pitchers under the pressure of competition: they will never throw the ball as fast as possible if they don't know where it will end up. If they hit the lady in the concession stand ("Just a bit outside"), I guarantee the next pitch will be slower!

## Wind up or stretch: no difference

First, let's start with debunking a myth. Professional teachers know that it makes no difference if pitchers throw from the wind up or the stretch. It makes no difference in velocity. Indeed, if anything, youngsters may end up throwing harder from the stretch because the better location they achieve by pitching from the stretch will give them the confidence they need to throw harder.

Because the biomechanics of pitching from the windup are more complicated, there is less room for error in pitching from the stretch (more movement, more problems). That is why we teach young players to ONLY throw from the stretch (less movement, less problems).

Children learning to pitch are influenced by a variety of sources: TV, old movies and cartoons. They mimic the pitching motion. They want to be a pro. It's fun to imagine.

Unfortunately, years of pitching with poor mechanics have a cumulative effect and add up to too many 14-year-olds in pain; the medical term is repetitive micro trauma. The pain is definitely not fun - but very predictable!

## Proper pitching mechanics: 6 critical points

There are a [number of ways to reduce the risk your child will suffer an injury pitching in youth baseball](#) [3], such as proper conditioning, warm-up routine, and [pitch limits](#) [4], but my focus here is on the role proper biomechanics plays in injury prevention, and, more specifically, the six points that are critical to a good pitching motion:

**Critical point #1 (lifting stride leg):** The first dynamic balance point begins as a pitcher lifts the stride leg. This is a recent change in philosophy. We used to teach pitchers that, to achieve a static balance point, they should "stop at the top." By that I mean, a slight pause at the balance point; similar to the position in the photo above. We now teach advanced pitchers a constant dynamic movement which is difficult to capture in a still photo.

If a pitcher is off balance at this point - by which I mean leaning in the direction of one of the three bases - the pitch location will most likely be a ball or at best will be a guess. The key teaching point: the bent leg and thigh up needs to be lifted to around 90 degrees from the body. Lower than 90 degrees may limit the motion, higher may throw off the balance.

For the moment let's put aside the slide step or other quick motions to the plate. But do remember this: if a pitcher is too quick to the plate because he is worried about a runner on first, and makes a bad pitch that the batter deposits off or over the outfield fence, few will care about how fast he was to the plate! A pitcher's number one priority when a man is on first is to make a good pitch (this is something that holds true at all levels of baseball, right up to the major leagues).

A right handed pitcher's knee should be pointing to third base (LHP to 1st base) and in front of the navel, directly below the glove. The hands should be in the same relaxed and comfortable position as if they were applauding. The body should be bent as if in a batting stance.

**Critical point #2 (timing):** Timing begins here. What is timing? Like a row of dominos poised to fall, timing is the proper sequence of the orderly movement of body parts. It begins when the hands separate and ends when all body parts are in the proper position to release the ball. Most mistakes in timing - late or early - happen during the hand separation phase. Early timing will most likely cause the ball to go low. Late timing generally makes the ball stay high.

From the "pitching stance" (same or similar posture as if the player were batting) in the stretch position, the player pushes the hands down as if pushing down the thigh. The stride leg moves straight down and then out towards home plate. The leg must land on the ball of the foot in a straight line, slightly closed (5 to 25 degrees) to the plate.

The pitcher's arms separate at the same time and move in opposite directions to an equal and opposite relationship. Elbows are 90 degrees from the torso. [Note: Recent reports from the medical community (*American Journal of Sports Medicine* and the American Sports Medicine Institute), show that raising the elbow higher than 90 degrees leads to significant arm impingement and increased risk of arm injury requiring surgery].

This is new. The shoulders are in a straight line towards the plate. Do not move either shoulder from that line and continue to move your elbows back and pinch your shoulder blades together. Extend your arms as if you were going to hug someone not as if you were signaling a touchdown. This position, referred to as scapular loading, creates less superior rotator cuff muscle impingement, uses less energy and .... can make the ball go faster This is called the launch position.





**Critical point #3 (power):** Power, the kinetic chain, begins, when the stride foot lands on the slope of the mound. From that point energy flows in a constant direction (and hopefully a straight line) up the body. In many versions of the wind up, motion stops, then reverses its direction. The thought of developing more momentum in the wind up is silly when you think of how many re-directional changes a complicated wind up involves. This is why so many pitchers lose control (balance) early in the wind-up even before the ball leaves their hand! The chance for a timing problem dramatically increases as well.

Stride length is easy to fix. Lay a pitcher on his back, with his heels touching the front of the rubber and the head toward home and mark a line at the top of the shoulder. Typical stride length is 85% of height. That is the distance is measured from the front of the rubber to the tip of your landing foot shoe. Much the same as in pole vaulting, as the foot lands, power drives up the leg. Next the hips must fully rotate and open, prior to the shoulders. The navel should be pointing at the catcher's glove. This establishes torque. This is exactly the same power sequence as in hitting. Hip and shoulder separation are key to sustaining velocity late in the pitch count.



**STOP HERE. STAND UP.** Yes coach/parent, I mean you.

- Get in a launch positions as described in the previous two pictures. You must experience some of these positions (You have an incentive too: learning this will help you throw better batting practice!!).
- Keep your throwing elbow in line with 2nd base and your glove elbow firmly fixed on home plate. Both shoulders should be in a direct line with the catcher's glove and second base.
- Turn your hips so your navel points to home. That stretch or burn is establishing torque or power that all good pitchers develop. Again, the same motion as in hitting! This hip and shoulder separation concept is also a key skill in golf. I believe they call it the X Factor and a good reason that so many ball players are good golfers.

By far the most common flaw relative to accurate throwing for any position including catcher, occurs in the graphic below, viewed from behind the pitcher; the best spot to discover balance issues. The right hand pitcher's back is bent, the head is also off center leaning toward first base and the hips are off center to the right. Subsequently the critical need for the eyes to remain level with the horizon fails. Level eyes are essential to establish depth perception (LHP is opposite). I've seen this flaw daily, for over 20 years.

View from BEHIND the pitcher



**Critical point #4 (elbow position):** The arm throws the ball. The body creates a solid foundation, shares the load and facilitates endurance. ASMI debunked conventional wisdom over 10 years ago: Jumping or pushing off the mound will not make the ball go faster. It will likely disrupt timing and make the ball go slower.

As the hips turn and arm follows, the body has created the foundation for the arm to move as quickly and efficiently as possible with the least amount of stress. This develops endurance with velocity and substantially reduces the probability of repetitive motion injury.

As the arm passes to the side of the body, the elbow should be no lower than 90 degrees from the shoulder and torso. Too high or too low is very harmful, leading to pain and poor performance. It is absolutely essential that all throwers' eyes be level with the horizon and the nose directly out and over the stride leg knee. This is the way all people walk straight.



**Critical point #5 (glove to chest):** This is also "not so new." Research proves that the (RHP) glove must stop over the knee and not fly or swing out towards 1st base. Credit here goes to Dr. Tom House who developed this technique over a dozen years ago. An accurate pitcher moves the chest to the glove. In our collective opinion, (the Pinkman family) **there is nothing more important** a child can do to throw the ball straight than to keep the glove side firmly in front of his chest in line with home plate and his eyes level to the horizon.

For many years conventional wisdom said that speed was increased by pulling the glove to the chest. As I have indicated before, recreational ball players almost always pull their core and upper body off-balance and dramatically tilt their eyes when they pull their glove to their chest. The glove usually ends up far away and to the side of their body. This action accounts for the overwhelming majority of pitchers who cannot consistently throw strikes. Yet we routinely see pitchers enter our academy who have been repeatedly and consistently instructed to pull the glove to their chest. (What have you read lately??)

Extending the glove to home plate and taking your chest to your glove produces a late release, decreasing the distance the ball travels in the air. This makes it very difficult for the batter to see and hit the ball. The power goes into the ball rather than continuing to circulate outside and to the left of the body, dissipating energy.

The actual mathematical equation states that for every twelve inches you can extend the ball release, you will gain 3 MPH of perceived velocity. However, you will lose 2 inches of arm extension to the plate for every inch your head moves off the center line between your nose and home plate.

There are many arm motions. Most of them are invented by Little Leaguers trying to imitate pros. Bizarre pro motions have somehow survived and serve the professional well. They are the result of natural, unconscious talent and cannot be changed. I would and couldn't teach those motions to children. Throwing a football is the easiest way to determine the natural arm slot or angle. The ball is too big and heavy to be creative in the throw.

Arm motions determine where the fingers will be on the ball at release. Consequently arm slot or position at release will have a huge effect on the flight of the ball, particularly in "curving" balls due to the intended or unintended axis of rotation imparted on the ball. There are some pitchers who just physically can't throw specific pitches due to their arm slot. Late timing has a big effect here too.

**Critical point #6 (follow-through):** Deceleration is the biomechanical term for follow-through. It is the necessary process the body must engage to stop the arm from moving. Overhand arm action, specifically throwing, is the fastest motion the muscular system can produce. It is natural. As former major league pitcher and current USC Pitching Coach, Tom House, says, "Our ancestors survived by throwing rocks at rabbits and spears at deer".

The problem is that there are many more muscles in the acceleration action than the deceleration action. Poor pitchers get posterior (back) shoulder pain from poor mechanics. We are seeing this in players as young as age nine. They also get sore from a lack of posterior shoulder conditioning. The follow-through is like a see saw. The knee is the fulcrum. If the body has attained the correct position; nose over stride foot, chest to glove, navel to catcher's glove, the head will go down, allowing the trailing leg to go up and over, landing slightly in front of and to the side of the stride foot. The torso should be

parallel to the ground with the back flat during this motion. The throwing arm on a RHP should be on the left side of the left knee. If the throwing hand thumb is pointing toward home - call the Doc and make an appointment for your child's soon-to-be acute pain.



IN ALL PITCHES the hand should pronate (rotate counter clockwise for RHP) and thumb should point to the rear as the arm comes to rest.

[Note: The argument about when a child should learn to throw a curve ball continues unabated, but the fact is that a pitcher is more likely to get an arm injury from throwing the fastball the wrong way. They throw them at full speed and more often.]

The body must land in a defensive position to field a ball hit from the aluminum bats everyone loves so much. The pitcher should stop in a position where the nose, navel and knees are all pointing directly toward home just as an infielder would. Quite often pitchers land in a very dangerous position where their feet are crossed and they fall off to the side of the mound. The glove will then be on the second base side of the body - totally useless. A pitcher has less than ½ a second to see and catch a line drive-time it.

## Take-away points

So here's the wrap up. Take time to learn. Obviously this short article will not teach you everything you need to know to train a pitcher. Hopefully, it will answer a question or two. But I do want this article to serve as opening the door to continued study. I hope you are curious. I hope you are motivated to continue to learn! You can teach!

- Minimize useless motion
- Stay balanced
- Step straight
- Point the glove at the target
- Hips open before the arm moves
- Keep the eyes level
- Point the nose at the target through the glove
- Decelerate completely -finish the throw

Pitching power (and all throwing for that matter) begins when the stride foot hits the ground. Get your nose and stride foot going directly straight to home, keep the eyes level to the horizon, control balance always maintaining the head over the center of gravity.

## Teaching points

- **Do not use vague terms** that a students cannot act upon or even understand like: "throw hard", - a wall is hard, rocks are hard. What does that have to do with throwing? "Come on --- throw strikes!" What do you think they are trying to do?
- **Take away stress and pressure.** Do not throw gasoline on the fire. I leave you to ponder this. How do YOU teach a child to throw inside verses outside; you ask them to do it all the time. Ask any player how to throw faster; I bet they cannot answer that question. Ask several pitchers at once and you will get as many different guesses.
- **Teach mental skills.** Baseball coaches have been saying for decades, "I can accept physical mistakes, we all make them. I can't and will not accept mental errors!" In my experience, the advice means absolutely nothing to players because they cannot act upon it!. Players are thinking to themselves, although never out loud by the intimidated player, "Coach, when exactly was it that practices mental skills?"

Baseball is backwards. It's the only game where the defense has the ball. The offense spends the whole game running away from the ball. The pitcher controls a game where his opponent, if he's good, fails 7 out of 10 times. But only if he throws strikes!

Please remember this always - Honor the Game

Contact me directly if you wish, I care.

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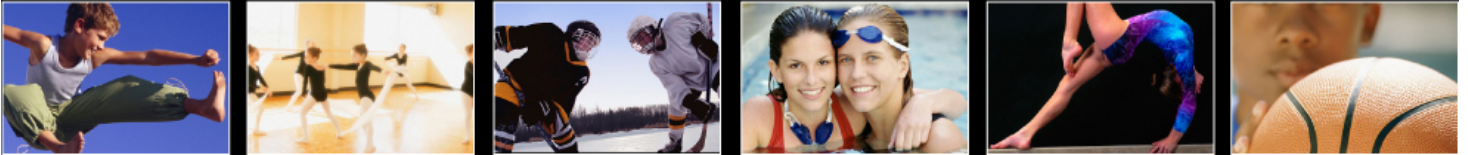
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One of the best ways to protect against arm injuries in youth baseball and maximize your child's natural ability is to teach proper pitching mechanics at as early an age as possible. Teaching your child about pitching mechanics doesn't need to be complicated, and it doesn't need to be too technical, but you and your child must be willing to commit enough time to understand the entire process, step by step.

Related articles:

[Preventing Pitching Injuries in Youth Baseball](#) <sup>[6]</sup>

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