

# How Roger Clemens (Actually) Throws The Ball

Chris O'Leary

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Chris O'Leary  
104 Elm Avenue  
St. Louis, MO 63122

[chris@chrisoleary.com](mailto:chris@chrisoleary.com)

314.909.9760 - Home  
314.494.1324 - Cell

<http://www.chrisoleary.com>

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## Introduction

I have found that many people are either confused, or hold significant misconceptions (as I did initially), about how major leaguers pitchers actually throw. They don't really understand what major league pitchers arms actually do.

That's the reason why I use the term "actually" in the title of this document.

As a result, I have put this document together to (hopefully) make clear what pitchers arms actually do as they throw the ball.

Just so nobody can complain about my using someone whose motion may not be standard, I have chosen to use Roger Clemens as my example. I hope everyone can agree that he knows a few things about how to throw the ball both well and hard.



### **Frame 1**

In Frame 1, Clemens has just broken his hands. He does this by swinging his pitching arm down and back toward Second Base by swinging his glove arm down, up, and out toward Third Base. As Frame 1 makes clear, Clemens breaks his hands before he starts striding toward the plate (most of his weight is on top of and to the First Base side of his pitching arm side foot and his glove-side leg is just starting to swing toward the plate). In this picture, you can tell from his grip the he is getting ready to throw a fastball.



**Frame 2**

In Frame 2, Clemens has begun to flex his elbow in order to move his pitching arm through the High Cocked (or High Guard or Power or L) position. His pitching arm side elbow is bent approximately 90 or 100 degrees and is roughly horizontal to the ground. His hips have opened approximately 45 degrees. The spikes in the back of his glove-side foot at just entering the ground and his toe is pointing pretty much directly at Home Plate. In this picture, you can tell from his grip the he is getting ready to throw a split-fingered fastball.



### Frame 3

In Frame 3, Clemens' arm is just about to pass through the High Cocked position. His pitching arm side elbow is bent approximately 90 or 100 degrees and is just to the Third Base side of vertical. His glove-side foot is now firmly planted. His shoulders have just started to turn (perhaps 10 degrees so far).

One thing to notice is that his elbows are approximately 20 degrees behind the plane of his back (what Dr. Mike Marshall calls the Acromial Plane), but they are below his shoulders which should protect his rotator cuff. A second thing to notice is that his hips have now rotated approximately 75 degrees and, more importantly, are leading the rotation of his shoulders. A third thing to notice is that Clemens is not showing the ball to Center Field. Rather he is showing the ball to Third Base. This will allow him to pronate his forearm as his elbow flies out and will help to protect his elbow.



**Frame 4**

In Frame 4, Clemens has just passed through the High Cocked position. The rate at which Clemens' shoulders are turning has increased significantly and his shoulders have turned a total of approximately 30 degrees. The inertia of the ball in his hand is causing Clemens' wrist to bend (it has bent approximately 20 degrees) as his shoulders start to turn under his forearm. His forearm is just starting to bounce (or lay back) toward First Base.



### **Frame 5**

In Frame 5, Clemens' shoulders have rapidly rotated perhaps 40 additional degrees (70 degrees total). Because he has a ball in his hand, Clemens' forearm is relatively end-weighted. As a result, this has caused his forearm to "bounce" or "lay back" approximately 70 degrees (this is what Dr. Mike Marshall calls Reverse Pitching Forearm Bounce) and his upper arm to externally rotate. The rate at which Clemens' shoulders are turning has not yet started to decrease, so his elbow is still bent the 90 to 100 degrees that it was when he passed through the High Cocked position.

One thing to notice is that Clemens' belt buckle is now pointing at home plate, which means that his hips have rotated approximately 90 degrees. You can also tell, by looking at how the buttons curve up the front of his jersey, that his hips are still approximately 20 degrees ahead of his shoulders. A second thing to notice is that Clemens is using his glove-side elbow to help rotate his shoulders. He has his glove-side elbow just below the level of his shoulders (approximately 75 degrees of abduction) and is pulling his glove into his glove side pec. A final thing to notice is that the palm of Clemens' hand is facing upward, indicating that he is pronating his forearm as his elbow starts to extend. This will help to protect his elbow.



**Frame 6**

In Frame 6, Clemens' hips have stopped rotating and his shoulders have just started to decelerate. Because of the inertia that has built up in his forearm, this is causing his elbow to rapidly extend. So far, his elbow has extended approximately 20 degrees.

One thing to notice is that he has internally rotated his pitching arm side leg such that his foot is vertical, his pitching arm side shin is facing the ground, and his pitching arm side toe is just off the ground. This helps to keep his hips rotating.



**Frame 7**

In Frame 7, Clemens hips and shoulders have stopped rotating. His hips rotated a total of approximately 100 degrees and his shoulders rotated a total of approximately 120 degrees. Because his shoulders stopped rotating just as rapidly as they started rotating, the momentum that was built up in his forearm caused his elbow to rapidly extend 90 or 100 degrees (this is what Dr. Mike Marshall calls Pitching Forearm Flyout). However, the fact that Clemens appears to pronate his forearm while extending his elbow may explain his relative lack of elbow problems.

One thing to notice is that his powerful stride toward the plate, which was abruptly stopped by his glove-side knee, has caused him to bend forward at the waist. This will lower his release point.



### **Frame 8**

In Frame 8 you can see that Clemens is continuing to pronate his pitching arm side forearm. He doesn't look like he does it as much as some because he seems to start pronating his forearm sooner (what I call Early Pronation), which helped protect his elbow.