

Pitcher's Physical Profile Work Book

Introduction

Thank you so much for purchasing this product. For me, this has been a labor of love building this profiling system/model along with the e-book that accompanies this product. If for some reason you don't know about the e-book that I'm talking about follow this link to learn the "why" behind this whole system that I call a model.

I call it a model because of this George Box quote

"All models are wrong, but some are useful".

My goal is for this to be useful to your work as a coach.

Why We Need to Assess

To me, there is no position within any sport that has such a wide variety in the type of athlete that can succeed at the highest level than pitching. Some pitchers are tall while some aren't. Some elite pitchers have tons of mobility while others don't. Some flame throwers can impress you in the weight room while others don't look like they have ever seen the inside of a gym. Due to this huge range of abilities across a larger spectrum of athletic traits we, as the baseball world, need something that can help coaches sort and separate the kind of athletes they have on the mound.

This model is aimed at helping you as a coach identify an athlete's strengths and weaknesses from a physical point of view. It can then serve as a tool to help you make better decisions that are backed by some quantifiable and objective data. In coaching, we call these "educated guesses". I have to use the word "guess" because that's what we are doing as coaches. I am guessing that if we do this type of training program coupled with these mechanical drills that this pitcher will throw harder.

A New Tool in your Coaching Tool Belt

To use this tool effectively, I suggest you read the e-book and then start testing it out with some pitchers. I wish I could tell you that this model can tell you right away why everyone on your team isn't throwing in the 90s and how you can get them all throwing 10 mph harder. If this thing could do all of those things, I'd be charging a lot more or some MLB team would have given me a lot of money to keep it a secret from everyone else.

It is simply a tool to add to your coaching tool-belt that can help you increase the percentage of players that you can positively impact. Many coaches have programs that they use because they have had success in the past which is great. After all, success leaves clues. But since there is such a wide variety of athletes that can have success on the mound there cannot be any one

program that helps every pitcher on your roster. Ultimately, we as coaches need to have the ability to adapt our coaching to meet the unique demands of the athlete in front of us right now. Sadly, in most cases, the athletes themselves are forced to adapt to the coaching. This model can help identify the differences between athletes so that you can start adapting to them.

Where Do I Get my Numbers?

In this spreadsheet the results you get from your athlete will be compared to some numbers that are baked in already. These numbers represent the high and low end of the spectrum that I've gathered over the years in person along with some results from research papers that I've reviewed. Every segment of the baseball population from professional, college, and high school are represented in the "norms" that I have used to create this spreadsheet. Because of that, this tool is best used for players who are about 15 years or older.

Intertester Reliability

Repeating these tests exactly the same each time might be hard. This is especially true when we assess mobility. Just try to do the test the same way to be the best of your ability so that we are comparing apples to apples so to speak.

Why only test one side?

In each test that could be done on both sides, we are only going to do the throwing side. The reason for this is...

- 1- Simple and time efficient
- 2- This isn't a diagnostic tool to look for asymmetries
- 3- We are only testing the side that matters in regard to a correlation to performance

Conclusion

Below you will get an in-depth explanation of how to execute each test. But before you do that check out this quick video where I demonstrate how to enter the data into this spreadsheet. If you have any questions at all please don't hesitate to contact me at: graeme.lehman@gmail.com

Speed & Strength Assessments

This is where you are going to be taking your pitcher through some traditional athletic tests. The ones that I've selected meet these criteria:

- 1- they relate to baseball performance
- 2- easy to implement and record accurate data

When it comes to accurately collecting the data some tests are easier than others. A test like the broad jump, for example, is pretty easy to be accurate but when it comes to the other tests like the sprint and pro-agility it can be a little tricky to get the exact score unless you have electronic

gate timers. If you have those, great. If you don't just do your best with your trigger finger on your stopwatch. You could also have your athlete do 2 or 3 attempts and take their average. Finally, if it is the same person using the stopwatch each time it's going to be more consistent from one testing session to the next.

To go one step further with respect to gathering the best information possible I would suggest practicing these tests a couple of times. The med ball throws especially need to be attempted a couple of times to get a feel for how they should be performed.

These tests are broken down into 3 categories

- Jumping
- Running
- Throwing

Most strength and conditioning coaches consider the big 3 to be the bench, squat, and deadlift. To me, running, jumping, and throwing are the big three when it comes to testing athletic ability. The proper implementation of exercises like the squat, bench, deadlift, and others will help improve someone's results of these tests that I'll describe.

Here are some of the reasons why we won't be testing these traditional weight room exercises:

- The Risk to Reward isn't there
- I don't know if the athlete you are testing has any business doing exercises like squats, deadlifts, and presses
- They haven't been shown to predict throwing velocity (non-specificity)

So, with that being said here are the athletic tests that we will perform

1. Jumping

1a. Broad Jump

We've all done this standing long jump (aka broad jump) before so we don't have to go into a lot of detail due to its simplicity. Here's how I get athletes to do it:

- Start with your toes up against the start line with your feet straddling the tape measure
- Start with your hands overhead
- Jump and land with your feet on either side of the tape measure
- Record the distance from the furthest back heel to the start line (if they fall backward, do it again)
- Max of 5 attempts – take their best score and measure the results in inches.

Here's a Video Example: https://www.youtube.com/watch?v=cg_NASdYh-8

1b. Lateral Jump

The lateral jump was the best predictor of throwing velocity in my thesis which looked at which field test best predicted throwing velocity. If you have a right-handed pitcher, we are going to just jump off the right foot following the description below. For lefties, do the opposite.

- Start by standing only on your right leg with the inside of this foot at the start line
- Start with both hands in front of your body
- Load by bringing both hands to the right and bend the right leg
- Jump as far as possible to the left
- Land with both feet at the SAME time and TOGETHER (an inch or two of separation is okay)
- Measure the distance from the outside of the right foot at landing in inches

Here is a video example: <https://www.youtube.com/watch?v=e2WreUSXvbU>

2. Running

2a. Pro-Agility (aka 5-10-5)

Ideally, you can use a gym floor, tennis court or dry pavement with running shoes. Turf also works as does grass but you just need to find proper footing because there will be a lot of slips.

Start this test by having the athlete put one hand on the center line at which point the coach will say “ON YOU”. This cues the athlete that they can go whenever they want. If you were to start the test by you yelling “go” we end up taking their reaction time into the equation which might be different from one test to the next. Allowing the athlete to start when they want takes out this “noise” and gives us better data.

A couple of extra notes:

- You have to keep facing the same way for both changes of direction – one stop to the left and one to the right. Don’t allow the athlete to stop on their preferred side twice.
- You must touch both lines and sprint through the center line as you would first base

Here is a video example: <https://www.youtube.com/watch?v=UtQwXzuPCiI>

2b. 30-Yard Dash

Set up two cones exactly 30 yards apart. Stand at the finish line so that you can get a better idea of exactly when the athlete crosses the line. It helps to stare at the ground by the finish line and hit “stop” when you see the athletes’ legs cross the line.

For the start of the test, tell the athlete when you are ready by saying “On You”. Once they hear that they are able to start whenever they like.

Since we are testing baseball players, we are going to use the base stealing stance.

Here is a video example: <https://www.youtube.com/watch?v=dq8yWs3EEG4>

3. Throws

These two tests will show us how well we can transfer power and momentum from our body to the ball. Just like pitching!!

These two throws require some practice to feel the best way to generate the best results possible.

Use a 6 lbs med ball.

Note – if you are dealing with some smaller or young (<15) athletes feel free to use a 4lbs ball.

3a. Rotational Throw

This test is the most recent addition to my list. It was added because of some research that demonstrated how it was a great predictor of throwing velocity as well as exit velocity and swing speed. Here's an article I wrote about this research study for Tread Athletics <https://treadathletics.com/rmbt/> It didn't make my list in the past due to the complexity but if you practice it a couple of times you should be able to figure it out. This test does require a radar gun to assess the speed of the ball. This is another reason why I didn't use it in the past but radar guns are more and more commonplace these days and even if you don't own one, I'm sure you can get your hands on one for a day.

- Stand with your feet about shoulder-width apart
- For righties get the athlete to have their left hand under the ball and the right hand behind the ball
- Hold your arms away from your body with a slight bend in the arms
- Rotate away from the target as you load
- Launch the ball as hard as possible into a wall about 5-10 feet away.

Use your legs and torso to generate all of the power

We are trying to take the arms out of the equation. They are just used to hold the ball

Here is a video example: <https://www.youtube.com/watch?v=mx1D3NtxMo>

In this video the athlete repeats the throw but we are only going to do one throw at a time so that we can measure the velocity.

3b. Backwards Med Ball Throw

Here's another simple test that can be pretty useful.

- Stand facing away from your target
- Hold the ball at full arm's length

- Swing the ball between your legs before throwing it backwards as far as possible
- Encourage the act of jumping as they throw. It is legal to land on the other side of the testing line.

Scoring tip: Don't worry about retrieving the ball. Get someone else to do that. Watch the ball fly through the air and have a stick in your hand to mark exactly where the ball lands. Mark the distance down in feet to the nearest half foot.

Here is a video example: <https://www.youtube.com/watch?v=JJoL9RDK7aM>

Anthropometrics Assessments

This section is interesting. It's interesting because this information is easy to collect. All you need is a tape measure. But when you try to figure out how to use this information it gets pretty complex. We don't know a ton about how to use this information when it comes to coaching a specific pitcher about their throwing mechanics. My hope is that this kind of information does get researched and we can start peeling back more layers of this onion we call pitching.

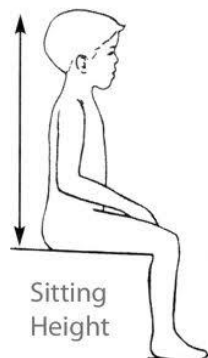
Here are the measurements that you will be taking with a simple tape measure. There are a couple of measurements that will be calculated for you along with some ratios.

Standing Height

Simple test but make sure you do it right! No shoes and head touching the wall. You need to be able to look straight ahead while having the back of your head in contact with the ground. When viewing from the side the ear opening and the eye should be level with one another.

Seated Height

Same rules as above but sit on a chair and measure from the seat.



Shin Length

While the athlete is sitting down, take this opportunity to measure the length of their shin. Go from the top of the knee to the bump on the side of the ankle (malleolus).



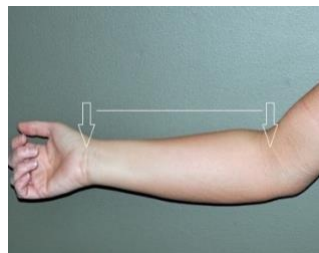
Hand Length

From the tip of your middle finger to the crease in your wrist at the joint. Bend/flex your wrist like you shot a basketball to determine where that crease is located. Since this is the smallest body part, we need to be more precise by measuring to the nearest quarter of an inch. Just enter them as 6.0, 6.25, 6.5, 6.75 for example into the spreadsheet.



Forearm Length

From the same crease of your wrist to your elbow joint. Go to the nearest half inch.



Half Arm Span

Measure the distance from the notch in their throat to their fingertips. Measure the nearest half inch.

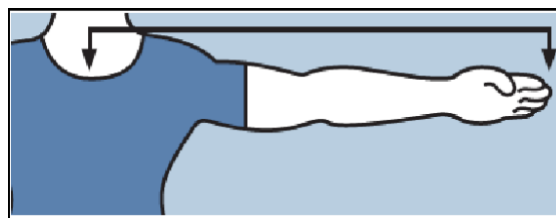


Figure 1 Credit Research Gate

Mobility Assessments

The goal here is to get a general idea of where this athlete sits on the mobility spectrum. Are they really mobile? Are they really stiff? Are they somewhere in the middle? All of our other tests and assessments need to be measured very accurately to produce the quantifiable and objective data we need to make smarter decisions. When it comes to testing mobility, it's always going to be the opposite, qualitative and subjective. Even if you happen to be a trained therapist it is very hard to quantify exactly how much internal rotation an athlete has at their hip, for example. The research has always shown that both inter-tester (two or more therapists) and intra-tester (the same therapist testing an athlete at two different times) reliability have poorly correlated.

Because it's so hard to get a really accurate reading we are only going to be recording the range of motion in degrees in increments of 5. Record shoulder external rotation, for example, as 115 or 120 degrees rather than 118 degrees.

There is the option of getting a local physio, chiro, or athletic therapist to do these tests for you. In my experience, these professionals are more than willing to help. Just bring them the list and let them go to work. If they ask why we are only recording the results from one side of the body refer them to the part in the intro where I stress that this is not meant to be a diagnostic tool for injury prevention. That's their department and if they want to measure both sides, tell them to go for it!!

More is Not Better

When we hear the word "test", we end up trying really hard to get higher score. When it comes to things like the jump's, sprint, or med ball throws I agree that more is better. When we test mobility, this shouldn't be the case. We want to see where you sit on the spectrum. So don't try to crank your shoulders or hips into uncomfortable and compromised positions.

Hip External & Internal Rotation

- Have the athlete lie on their back
- Bend their throwing knee and hip to 90 degrees
- With one hand on the ankle and the other on the knee cap rotate their foot like a windshield wiper. The hand on the knee keeps it stationary and serves as a pivot point.

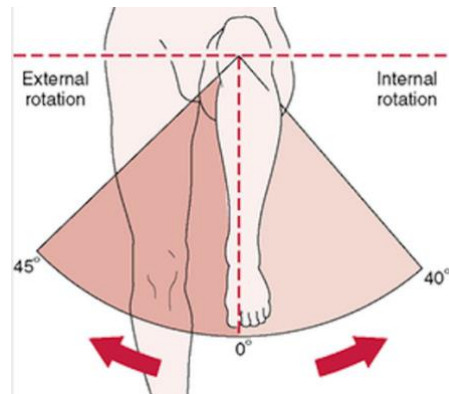
When you move the foot away from the body you are internally rotating at the hip.

See how far you can move that way without any compensation (the other hip needs to stay motionless).

Then move the foot towards the middle of the body like they are sitting cross-legged. This movement occurs due to external rotation. Take a picture of the max distance before you feel and restriction or the athlete's body is moving in an attempt to gain more movement.

Check out this video for more details. Go to the 2:28 mark for how to assess internal rotation and 2:48 for hip External

<https://www.youtube.com/watch?v=3lTv4gpRWxg503-87-2050>

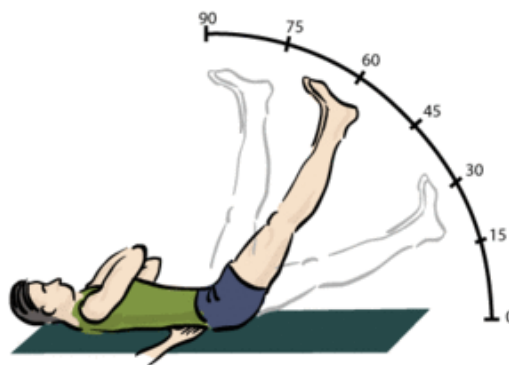


ASLR – active straight leg raise

- Lie flat on your back with arms folded across your chest
- Legs are fully extended
- Lift the leg (right for righties) up with a straight knee

The test ends when the back of the knee on the downside (left for righties) comes up or the back arches. Also, try to keep the toes of the down leg pointed straight toward the ceiling – they will want to rotate outwards in most cases.

Take a picture at the top of the movement when the athlete has control of the leg while the knee of the down leg and back are still in contact with a small towel or hand beneath them both.



Here is a video example: <https://www.youtube.com/watch?v=lvrzAEzhj8U>

Seated Rotation

- Sit with your knees and hips bent at 90 degrees – a normal chair works for most

- Place a rolled-up towel or yoga block between your knees
- Hold a stick across your collarbone with your arms in a crossed position.
- Right arm should be touching your left shoulder and vice versa. Keep this position throughout with arms staying parallel to the ground. I always get people to pretend they are holding a tray of glasses on the platform created by their arms in this crossed position.
- Rotate in a controlled fashion as far to your right as possible while still having the block between the knees. We are obviously testing the ability to separate the hips and shoulders. Any movement of the hips, knees, or feet ends the test.
- For righties, see how far they can rotate to the right

Stand behind them to see where they can get and hold for a second or two.

If they get the butt end of the stick on the right side of the body point straight ahead of where their knees are pointing, they would have 90 degrees of rotation

You can also try standing on a chair behind them and get a “bird’s eye view” of how these two body segments can separate.

Be under control here. We want to see how much movement occurs under control. When we pitch there is sure to be more rotation since we are violently rotating.

Here is a video example: https://www.youtube.com/watch?v=-_Bw7tV2FdY

Shoulder Flexion

- Lie on your back with your knees bent so that your feet are flat on the bench/ground
- Keep your low back pressed into a hand or towel
- Place your non-throwing hand on the right of your rib cage
- Point your throwing arm straight up to the sky
- Slowly allow the straight arm to fall toward the ground.

We are looking to see how far the arm can go overhead toward the ground without:

- the low back coming off the ground
- rib cage arching
- elbow bending
- arm moving away from the body – if you look at them from their feet towards their head, the arm should move in a perfectly straight line as if it was moving on a railway track.

You can cue the athlete to pretend that they are up against a wall on the throwing side of their body with wet paint and they don’t want to get painted.

It should look like the upper body version of the straight leg test we did.

Here is a video example: <https://www.youtube.com/watch?v=QERaSy9koGs>

Shoulder External and Internal Rotation

This one is going to be the most technical so take your time. You will lie the athlete on a surface like a bench, table, or countertop so that the hand can go past the level of the ground which represents 90 degrees of external rotation. Every pitcher should be able to easily get past this point so we have to use an elevated surface that the pitcher can lie on comfortably with the knees bent and feet flat.

Get the athlete to lift their arm so that the elbow and shoulder are in-line and bend the elbow to 90 degrees.

Place one hand on the front of the athlete's throwing shoulder and the other wrist/hand.

It's important to keep the shoulder from moving – this is why we have one hand placed on the shoulder to keep it still. This is especially true when we try to measure internal rotation when the shoulder wants to tip forward.

- Here's a video for external rotation: <https://www.youtube.com/watch?v=l4UMzZR67I>
- Here's a video for internal rotation:
<https://www.youtube.com/watch?v=wDmlUSwNvyM>

Here's a link for a quick overview and demo video
<https://youtu.be/jhuXyln9v5o>

There you have it!!

I hope that this document answers any questions that you have about how to assess your pitchers.

Thanks,

Graeme Lehman, MSc, CSCS