


ADVANCED HITTING EVALUATION



ATHLETE NAME: Mickey Mantle
DATE: 11/13/2024

HITTING LEVEL/FLAW OF FOCUS & ROUTINE	KEY METRICS OF FOCUS	VIDEO ANALYSIS
Level 1: Late Transfer Basic Vision + VOR	Time from forward move start to contact. Current Time: .4 Sec Goal: .7-1 Sec	

Athlete hits: Right

Pelvis Segmentation Test

Can the athlete move their pelvis without moving their upper body?

This movement is essential for building elastic potential across the body. When an athlete can reach a solid amount of stretch, they can use that stretch to generate a quick and powerful rotation.

Results: Pass to Athlete's Right, Pass to Athlete's Left



Seated T-Spine Rotation Test

As a baseball or softball player, being able to rotate your thoracic spine is very important. The rotation of your pelvis builds potential energy across the core, but the rotation of the thoracic spine transforms that potential energy into kinetic energy.

Results:

Pass to Athlete's Right, Pass to Athlete's Left

Estimated Degrees to the Right: 75

Estimated Degrees to the Left: 60

Balance Twist In and Out Test

Not only is the stretch between your pelvis and rib cage important, but also the stretch between your femur and pelvis. If we can internally rotate our femur during the loading phase, it builds potential energy across our posterior sling. At the beginning of rotation, elite hitters externally rotate their femur, which builds potential energy across their anterior sling.

Balance Right: Pass

Balance Left: Pass

Right Leg IR: Fail
Right Leg ER: Pass
Left Leg IR: Pass
Left Leg ER: Pass



Next-to-the-Net Circles Test

The Next-to-the-Net Circles Test is hugely important because it measures an athlete's ability to side bend to low pitches. If we want to hit low pitches well, we need to be able to side bend so we can rotate to the pitch and extend through it. Most hitters who struggle to side bend tend to extend down to low pitches, which results in weak ground balls and clipped pop flies.



Results

Hitting Side: Failed Movements

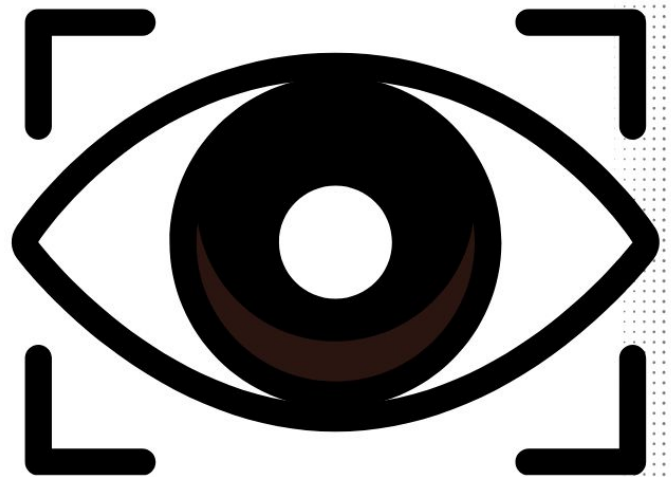
Failed - Front of the circle

Non-Hitting Side: Failed Movements

Failed - Finish Feet Balance

Baseball Vision Evaluation

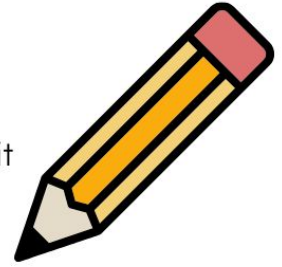
Everyone knows that vision is important in hitting, but it's rarely assessed or trained in a functional way. This is something we are passionate about, as being a productive hitter is only possible when your vision is functional.



Vision - Convergence

Pencil Push Up Test

The Pencil Push Up Test measures how well your eyes can track a ball as it moves toward you. Humans use binocular vision, meaning both eyes are pointed at the same object. When the object moves toward us, our eyes need to come together to follow it. This test measures how well you can do that.



Results:

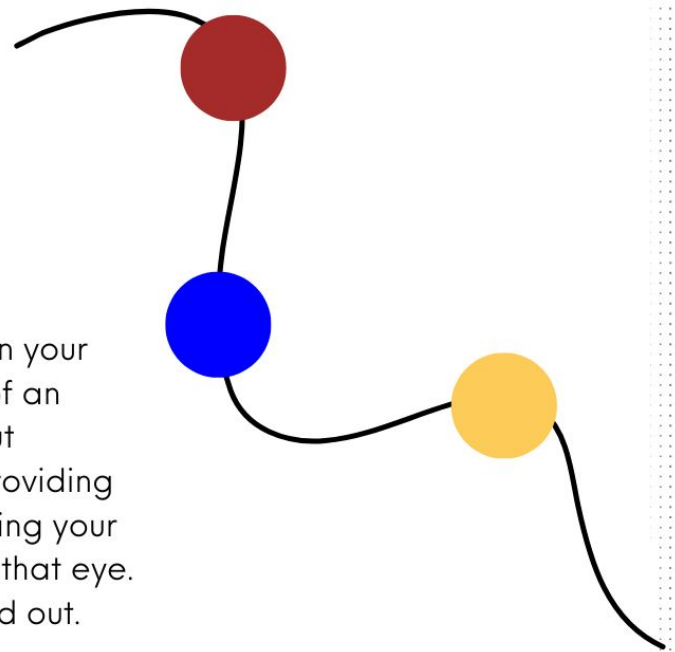
Where does the pen split? It doesn't split

Which eye is restricted?

Both

Vision - Brock String - Suppression Test

This test measures how much trust exists between your brain and each of your eyes. While this is a bit of an oversimplification, the easiest way to think about suppression is that one of your eyes has been providing the brain with faulty information over time, causing your brain to distrust the information it receives from that eye. Is this happening to you? This test will help us find out.



Results:

Closest Ball - The athlete struggled with -

Second Ball - The athlete struggled with -

Can only see one line going out

Smooth Pursuit Test

Smooth pursuit is how our eyes track a slow-moving object. It is a fundamental vision skill that allows us to lock on to and track something moving at a relatively slow pace. You might wonder, if the object is moving slowly, how is this skill applicable? In baseball and softball, objects move quickly. However, smooth pursuit is a foundational vision skill—if you can't do this effectively, it will be difficult to perform more complex tasks. Walk before you run. Smooth pursuit before saccades.



Results: **Left, Down + Left**

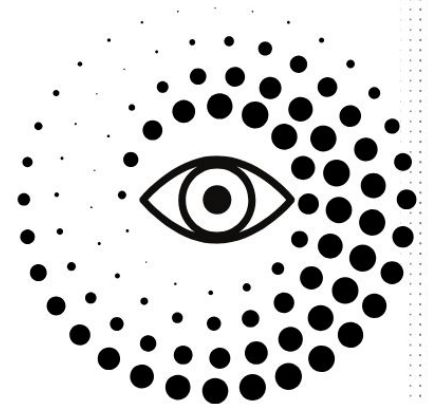
Vestibular Ocular Reflex Test

Your vestibulo-ocular reflex is related to your inner ear. This reflex helps you keep objects fixed in your vision when your head is moving.

You need to continue looking at the ball when you're swinging. If the vestibulo-ocular reflex is not functioning well, it will be difficult to do that.

Only report what was failed

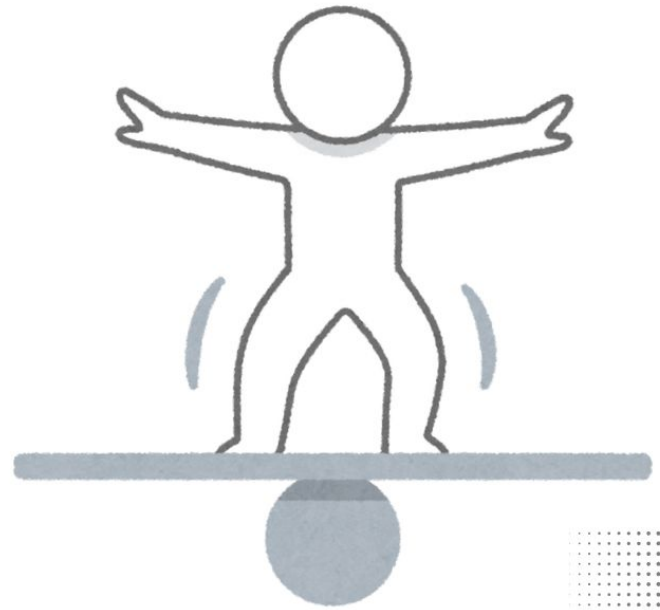
Results: **Up + Right**



Vestibular Ocular Reflex + Balance Test

Your vestibulo-ocular reflex is related to your inner ear. This reflex helps you keep objects fixed in your vision when your head is moving.

This test forces the athlete to balance and keep the object in the center of their eye socket as when compared to the standard VOR test.



Results: Only Report what was failed

Right Behind Left

Up + Right

Left Behind Right

Up + Right

Neck Mobility Test

If your neck is not mobile and strong, it will be hard to keep your head on the pitch. Additionally, weak neck muscles are correlated with weak eye muscles.

Results: What did the athlete fail or pass with pain?

Neck Rotation Right - Pass with pain

Diagonal Length Left - Fail, Forward Head Glide - Fail



ADVANCED HITTING EVALUATION MOVEMENT METRICS - KINEMATIC SEQUENCE

Kinematic Sequence

This is the measurement of the precise and coordinated movement pattern of the body parts—hips, torso, arms, and hands—during a swing. This sequence follows an ideal order where energy is transferred efficiently from the ground up through each body segment to generate maximum power and speed. The kinematic sequence matters in baseball because it directly impacts performance; an optimized sequence helps players achieve higher bat and better control, reducing strain on the body and lowering the risk of injury.

KINEMATIC SEQUENCE

Average Peak Velocities

Pelvis

562°/s

Pro range
500 - 600°/s

Trunk

748°/s

Pro range
575 - 700°/s

Arm

985°/s

Pro range
800 - 1000°/s

Speed Gain

Average speed-up from Pelvis to
Torso

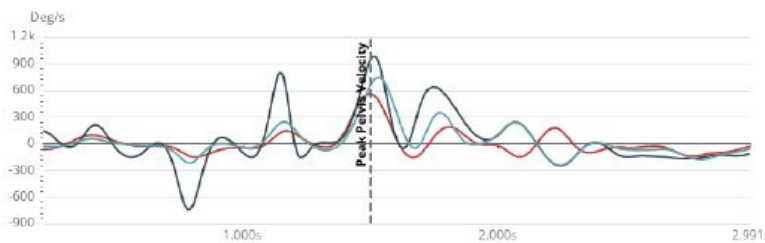
1.33x

Pro range
1.05x - 1.25x

Your most common sequence:

Pelvis - Arm - Trunk

Ideal sequence is **Pelvis - Trunk - Arm**



ADVANCED HITTING EVALUATION MOVEMENT METRICS - LEVEL 1 - THE FORWARD MOVE

The Forward Move and it's Speed

The way we move our pelvis forward during our stride is the most important factor when it comes to hitting a baseball or softball consistently.

In hitting, a weight transfer must happen. To make a swing, we have to de-weight our back foot. The process of de-weighting our back foot takes time, and if we wait too long to begin shifting our pelvis forward, we'll try to transfer weight so quickly that we won't be able to keep our head still. (This will create many other problems.)

A simple way to measure if this is happening properly is to quantify the time at which the athlete begins moving their pelvis forward and compare it to when they make contact with the ball.

This will tell us how quickly the athlete executed their forward move. When this happens in a very short period of time, hitters struggle. When they take their time, hitters perform much better.

Time From Forward Move Start to Contact: .4 Seconds

.5 Sec and under = Too fast

.5-.7 Sec = Ok

.7-1 Sec = Great

ADVANCED HITTING EVALUATION MOVEMENT METRICS - X FACTOR + ROTATIONAL SPEED

X - Factor Stretch

X-Factor stretch refers to the difference in degrees between where the pelvis points and where the rib cage points. At different points of the swing, we want these numbers to be different. At our peak X-Factor stretch, we want the pelvis to be quite a bit ahead of the rib cage—around 35° would be ideal. By the time we get back to contact, we want our X-Factor stretch to return to 0° or very close to that.

We refer to the act of creating X-Factor stretch as “opening the gap.” This gap is the difference between where our pelvis points and where our rib cage points. When we bring our X-Factor stretch back to zero, we are “closing the gap,” and we want to do this very quickly. When we open the gap, we are building potential energy; when we close the gap, we are converting that potential energy into kinetic energy.

X-Factor



Averaged across all swings, your max X-Factor prior to ball contact was

27°

Time to Open Gap: .08 Seconds Time To Close Gap: .05 Seconds

ADVANCED HITTING EVALUATION MOVEMENT METRICS - PELVIS AND RIBCAGE ROTATION

How Much You Rotate

The amount of rotation in the pelvis and rib cage is crucial. If we stop our rotation too early, it induces swings that roll over toward the pull side and produce a lot of ground balls. This is not a desirable outcome.

Under-rotating can also signal that the athlete is very hands- and arms-dominant in their swing.

Pelvis Rotation at Contact: 85 Degrees

Ribcage Rotation at Contact: 85 Degrees



BLAST

Bat Speed (MPH) - Max: 72 MPH	Avg: 68 MPH
Time To Contact (sec) - Min: .12 Sec	Avg: .16 Sec
Rotational Acceleration (G) - Max: 21.3 G	Avg: 15.5 G
Power (kW) - Max: 4.7 kW	Avg: 4.2 kW
Early Connection (degrees) - Avg: 84	% in range: 75%
Connection at Impact (degrees) - Avg: 83	% in Range: 82%
Vertical Bat Angle (degrees) - Avg: 33	Mismatch?: No
On Plane Efficiency (percent) - Max: 72%	Avg: 63%
Peak Hand Speed (MPH) - Max: 23 MPH	Avg: 20.2 MPH