An Analysis of the Discus Throw

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LaPlace, Louisiana
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Factors That Govern All Throws

- The approach of the throw is designed to maximize the following:
  - Velocity (speed) of the implement at release
  - Angle of the implement at release
  - Height of the implement at release

Velocity of the Implement at Release

- Rhythm of the throw is slow to fast, therefore, it is an acceleration
- There is a hinged moment

Angle of the Implement at Release

- The discus has an appropriate orbit
- The body has optimal positions from which to deliver the disc
  - Axes of rotation
  - Lever systems

Height of the implement at Release

- As in everything you do in Track and Field, at the moment of truth, you should be as tall as you can be

Life is Not Fair!

- Most of our athletes should have chosen better parents
- The greater the athlete, the more they can get away with and still perform well
  - Can have a bad start and still fix it before delivery
- The poorer the athlete, the greater the propensity for their mistakes to compound cumulatively until a complete disaster ensues

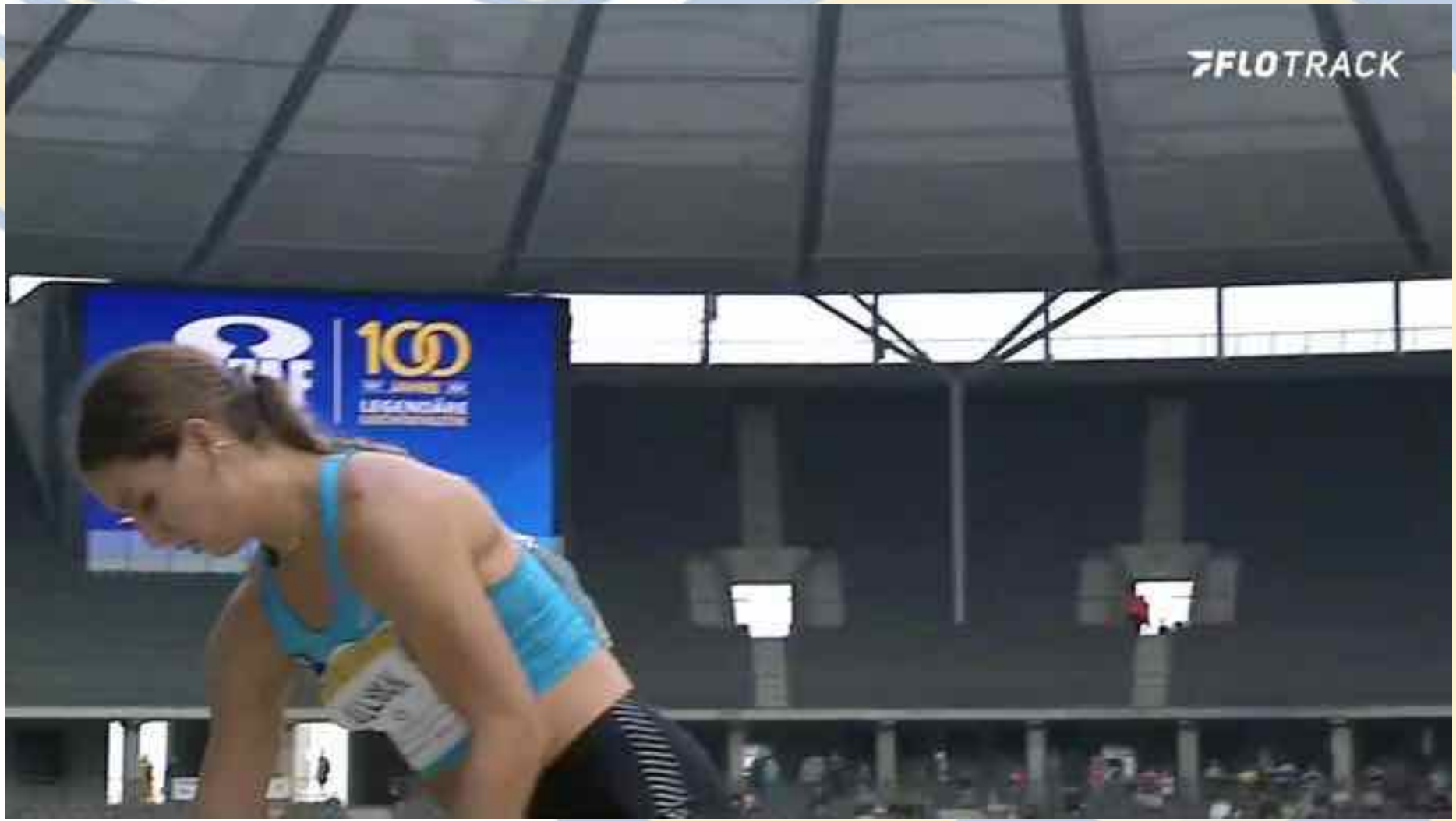
There Are Weeds Everywhere!

- Everyone has imperfections and therefore compensations
  - Layers of an onion
- All weeds have roots

Developing/Discovering a Model

- It is important to have a model from which the coach can develop/discover key performance indicators (KPIs)
- Olympic athletes are most often used as these models
  - This can be good and bad for the novice thrower

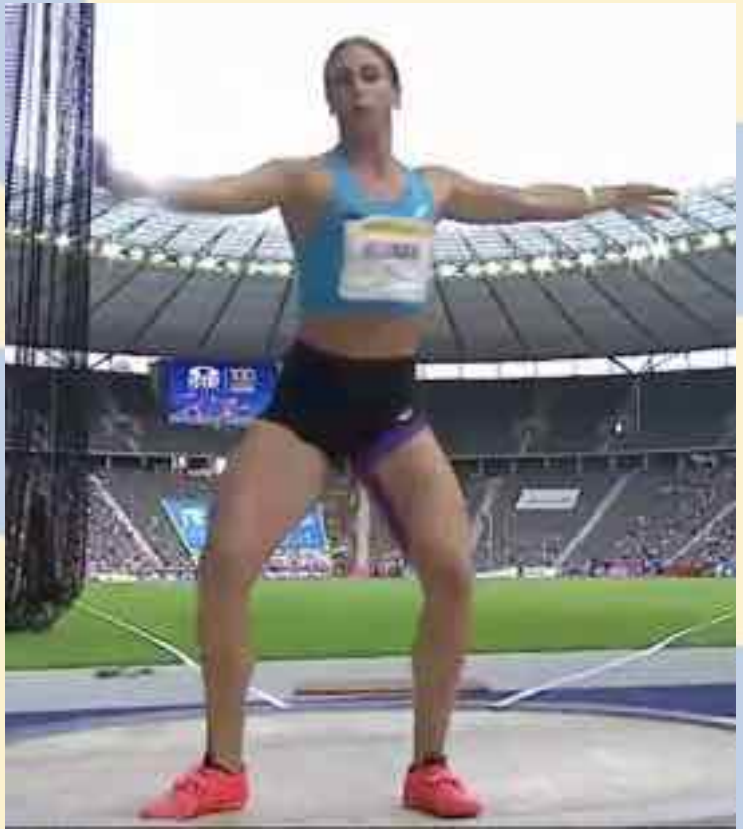
Valarie Allman (71.16m/ 233’ 5.5”)



Daniel Stahl (74m-ish foul)

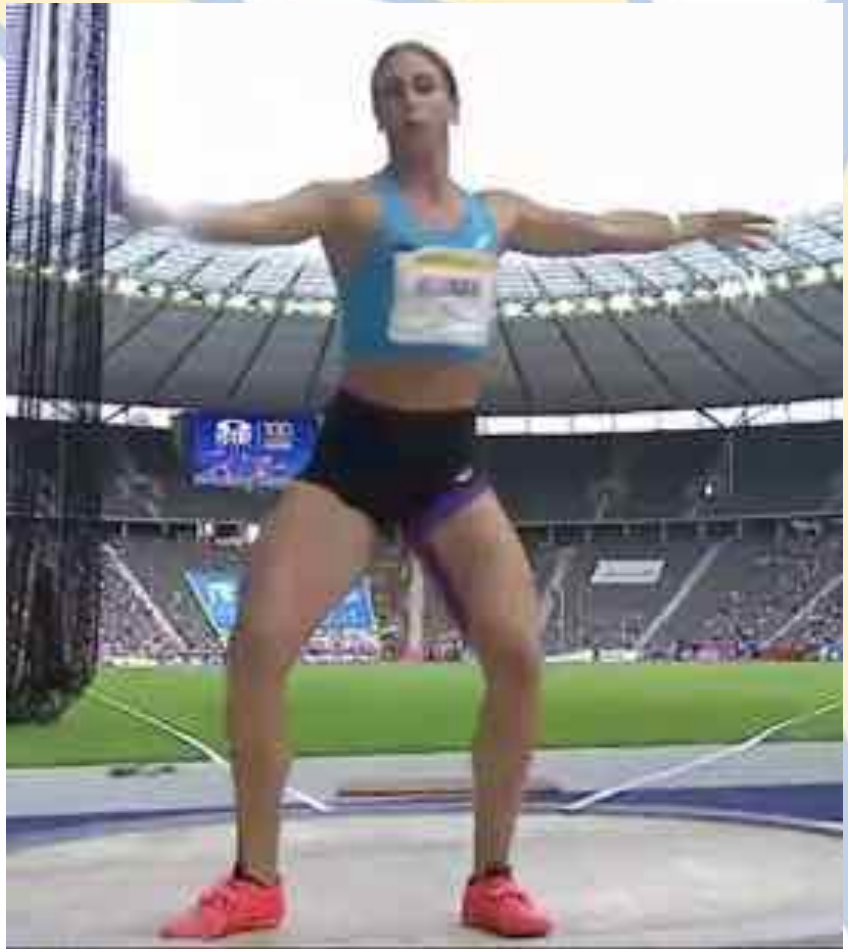
Initial Set Up

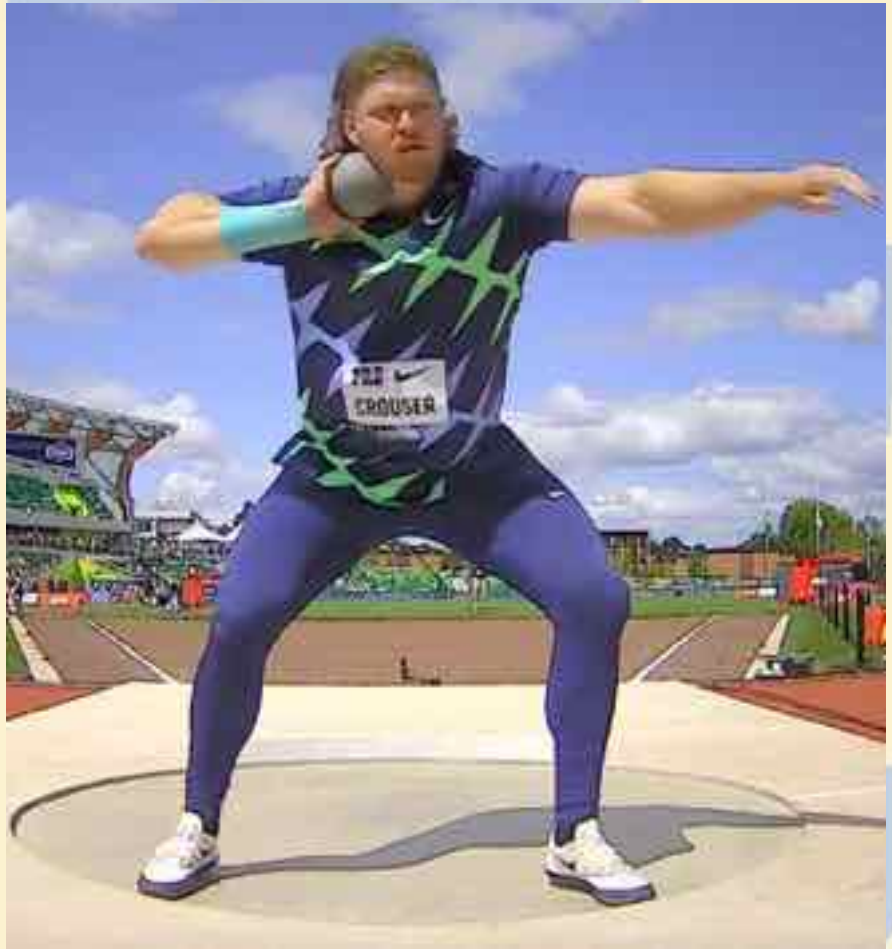
- Center of Ring, feet shoulder width apart, knees bent, feet dorsiflexed
- Relatively tall posture



ROT SHOT DIFFERENCE

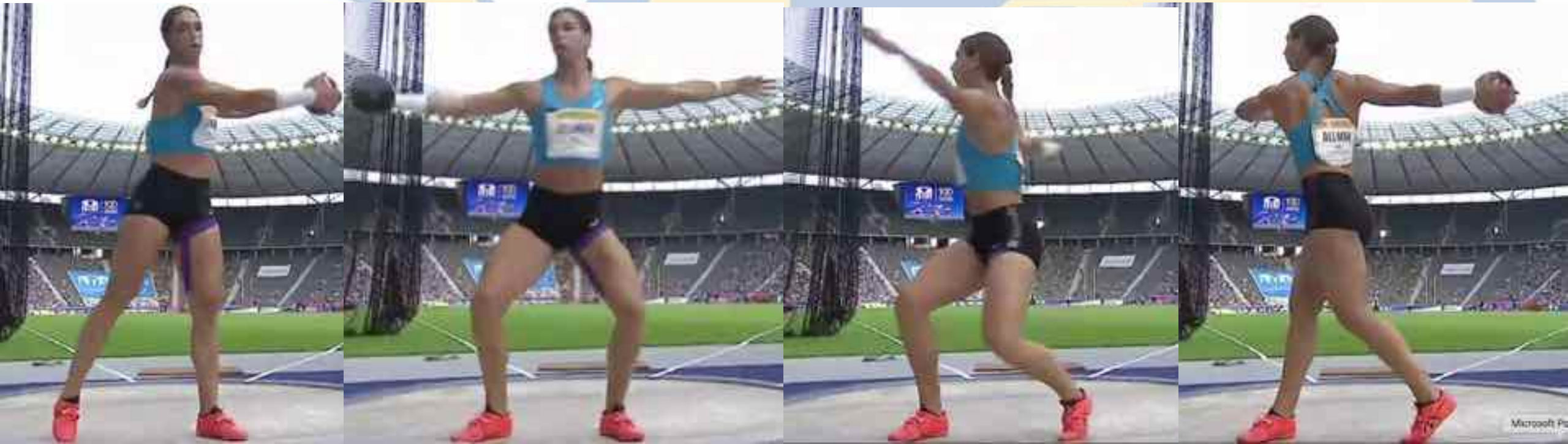
- Initial set up has much more bend in knees and hips



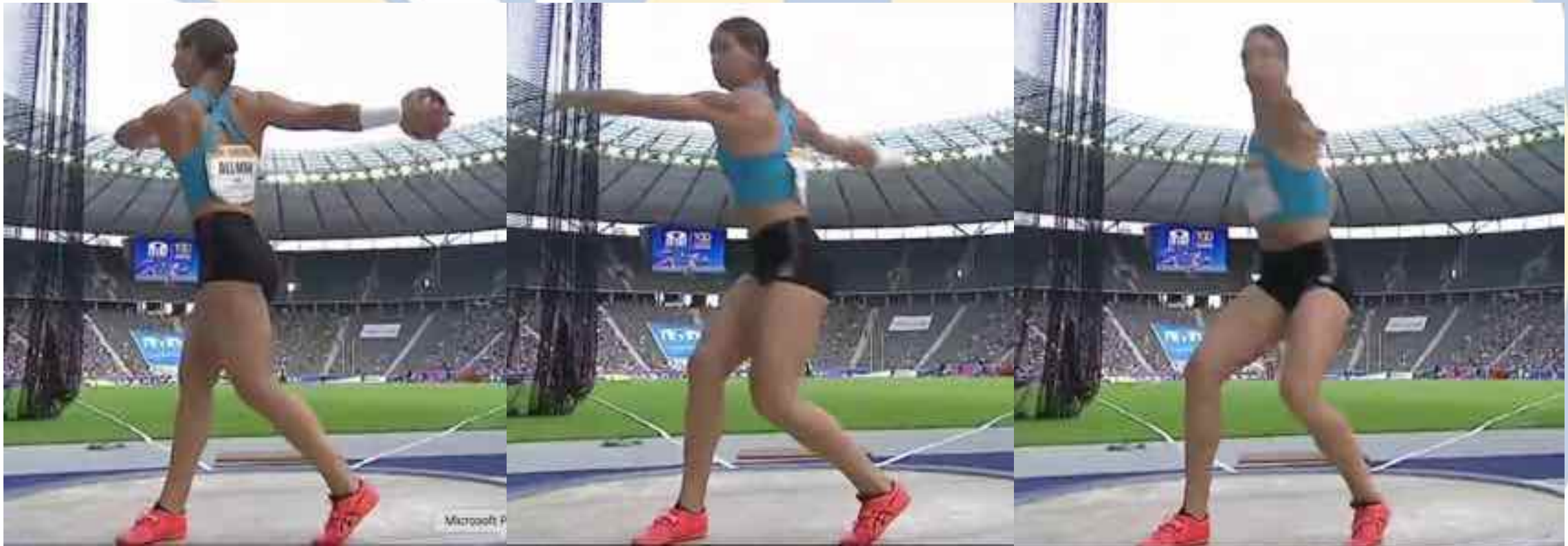


Counter Move

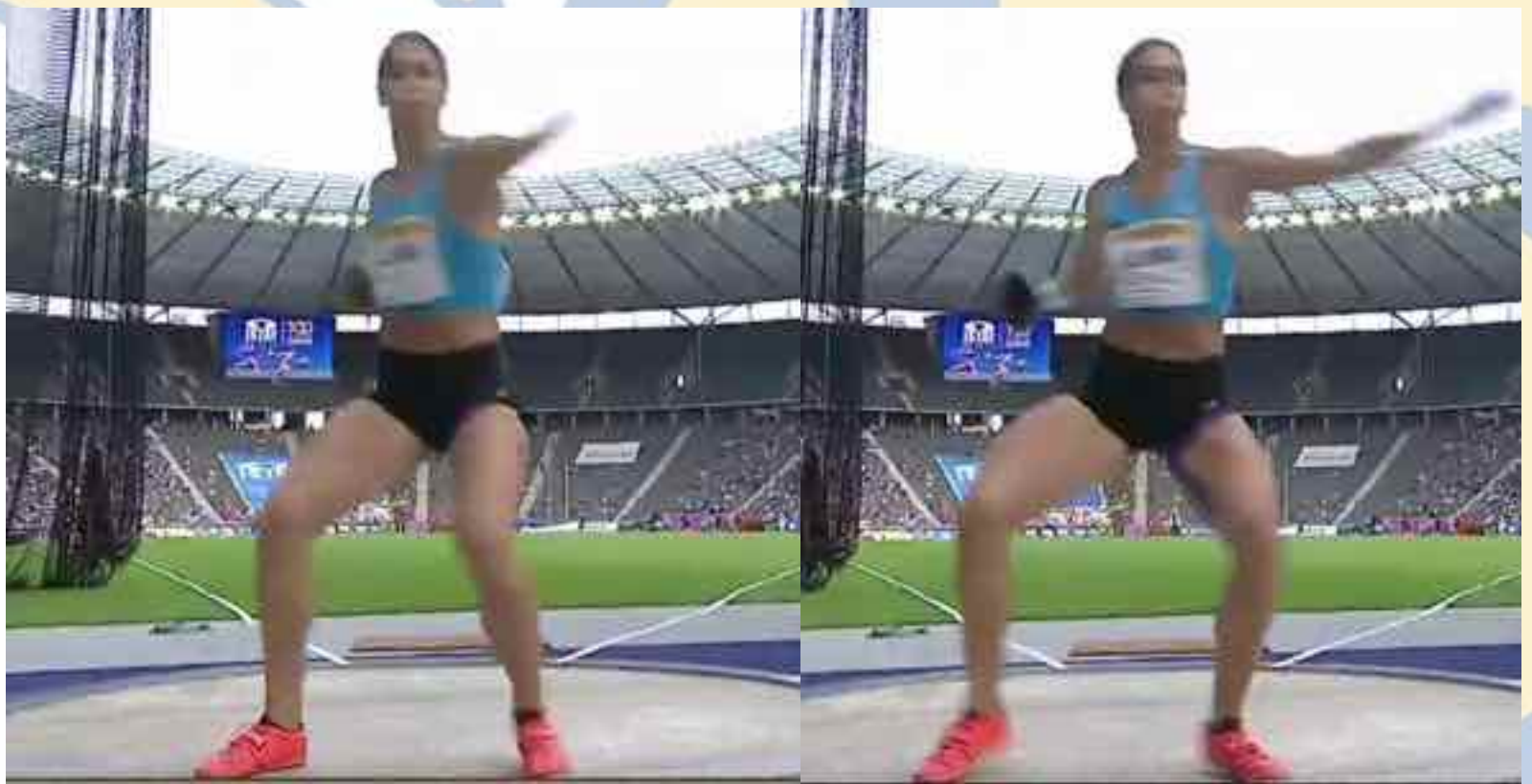
- Creates separation in shoulders/hips & disc/body
  - Establishing body positions that enhance stretch-reflex
  - CAUTION! Careful that a reflex moment is not created because of accelerating in the wrong direction



- Shifting weight to develop momentum for initiating the approach
  - Thrower must unseat in the proper direction

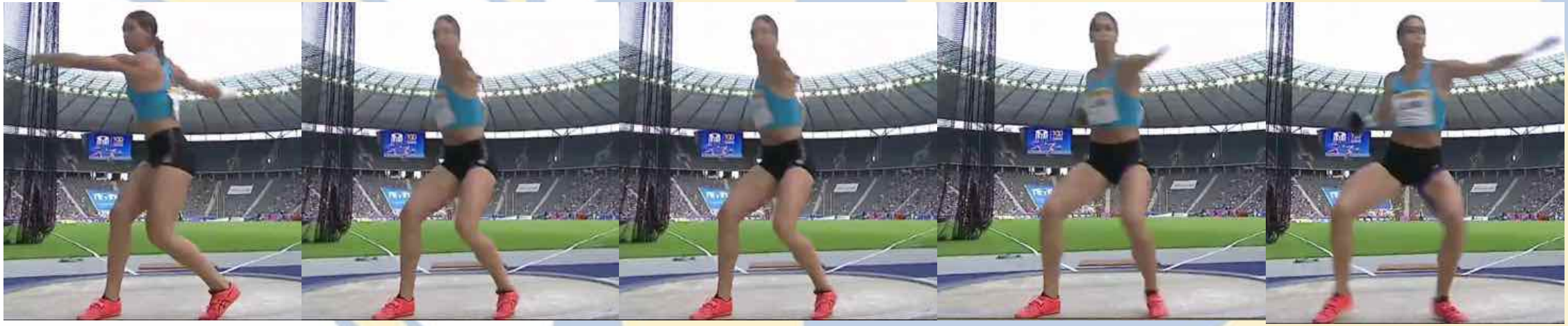


- The left foot/hip is the axis for the primary turn of the approach
- The right leg is activated as soon as an sufficient weight shift has occurred



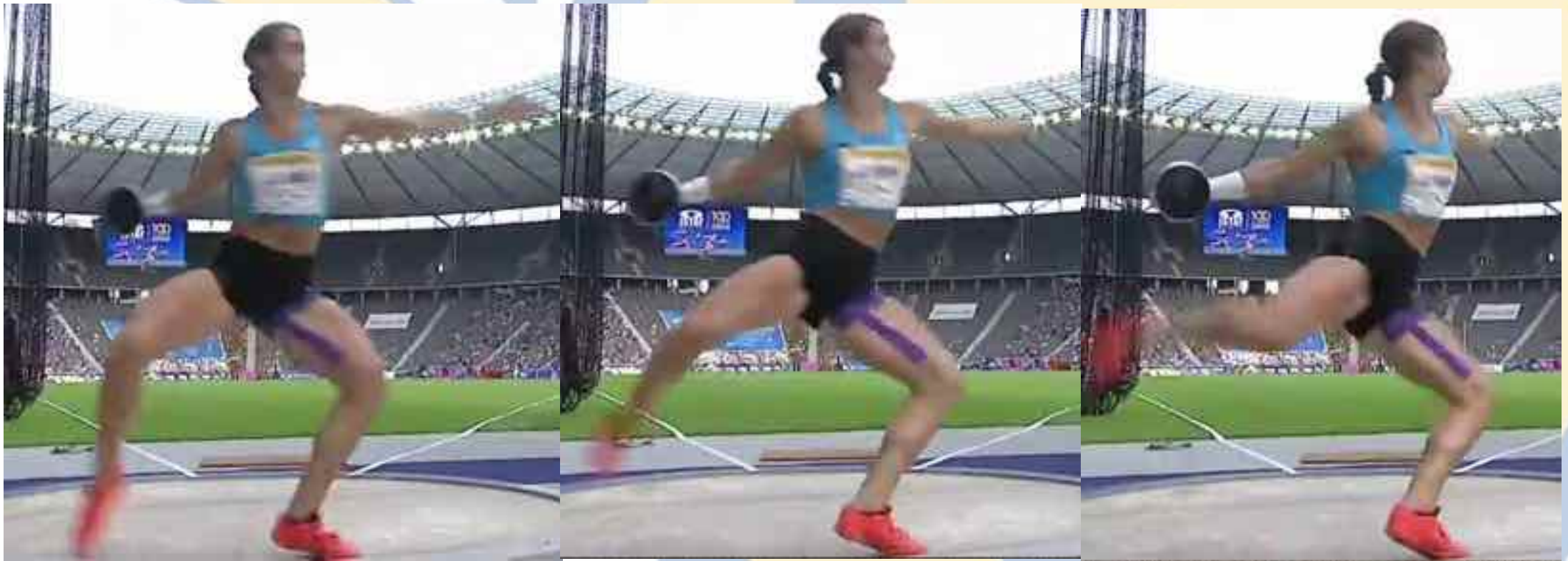
Quarter Turn

- Eyes lead followed by knee, then elbow/shoulder

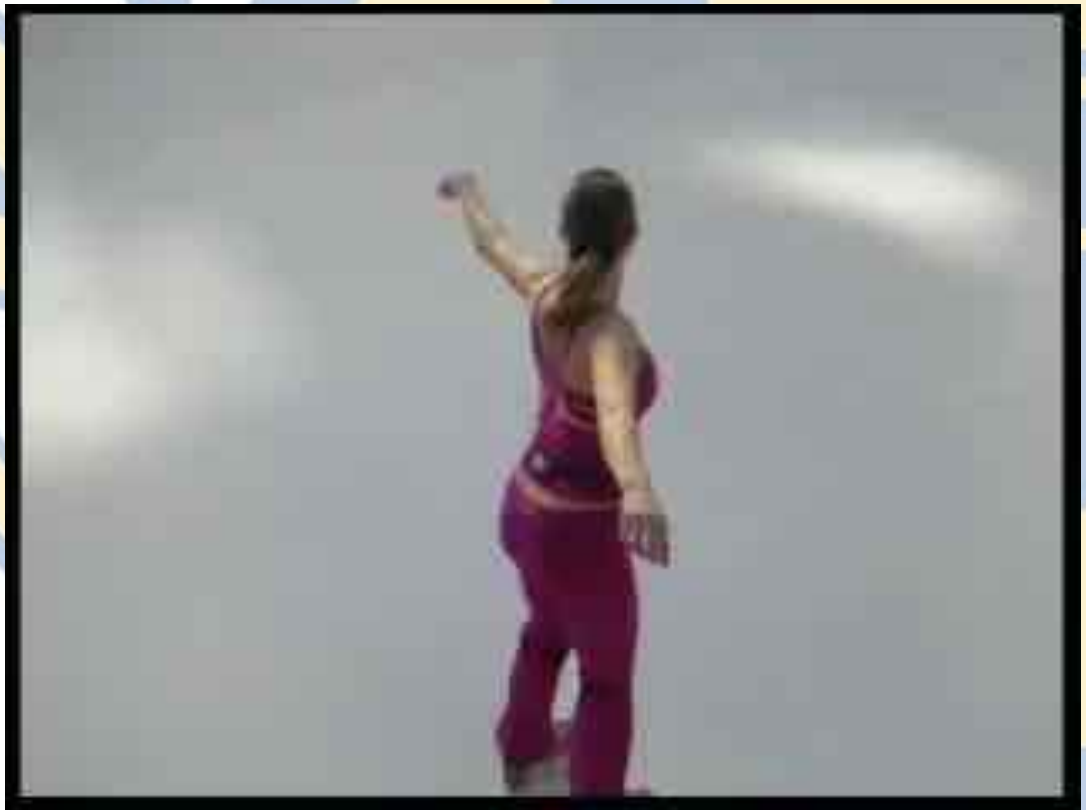


Quarter Turn

- At 90 degrees, thrower should be off the right foot
- Skateboard push/extension of the leg in a direction that facilitates rotation about the left foot
- Left foot/LEG must actively turn

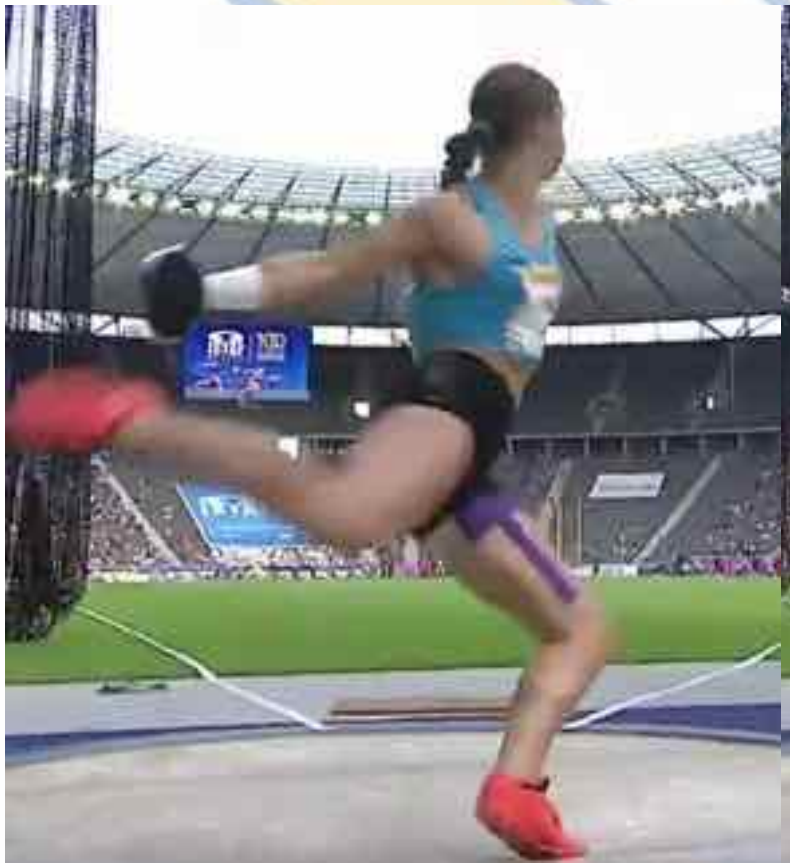
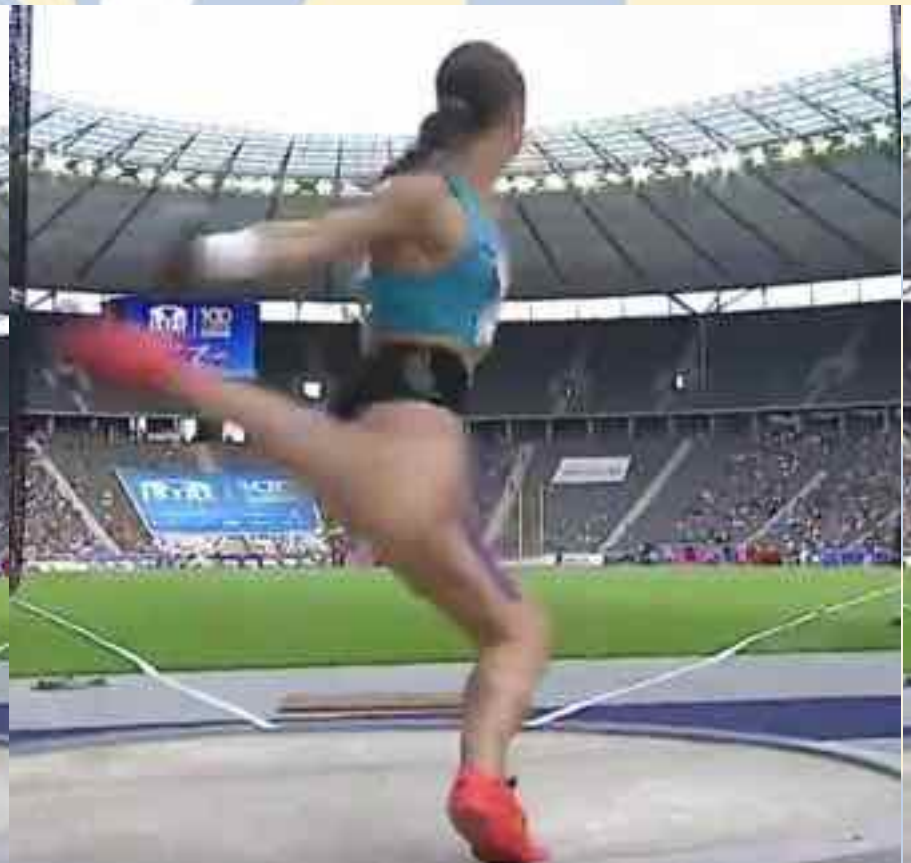
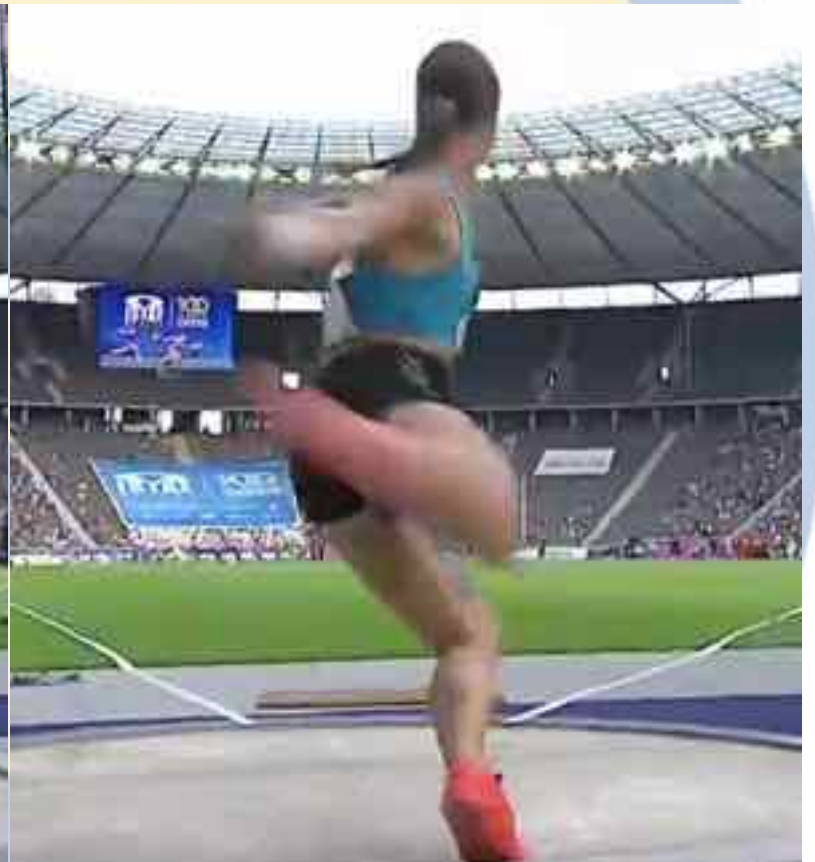


- We must recognize a couple of basic ideas of biomechanics/physics regarding the conservation of angular momentum and axes of rotation



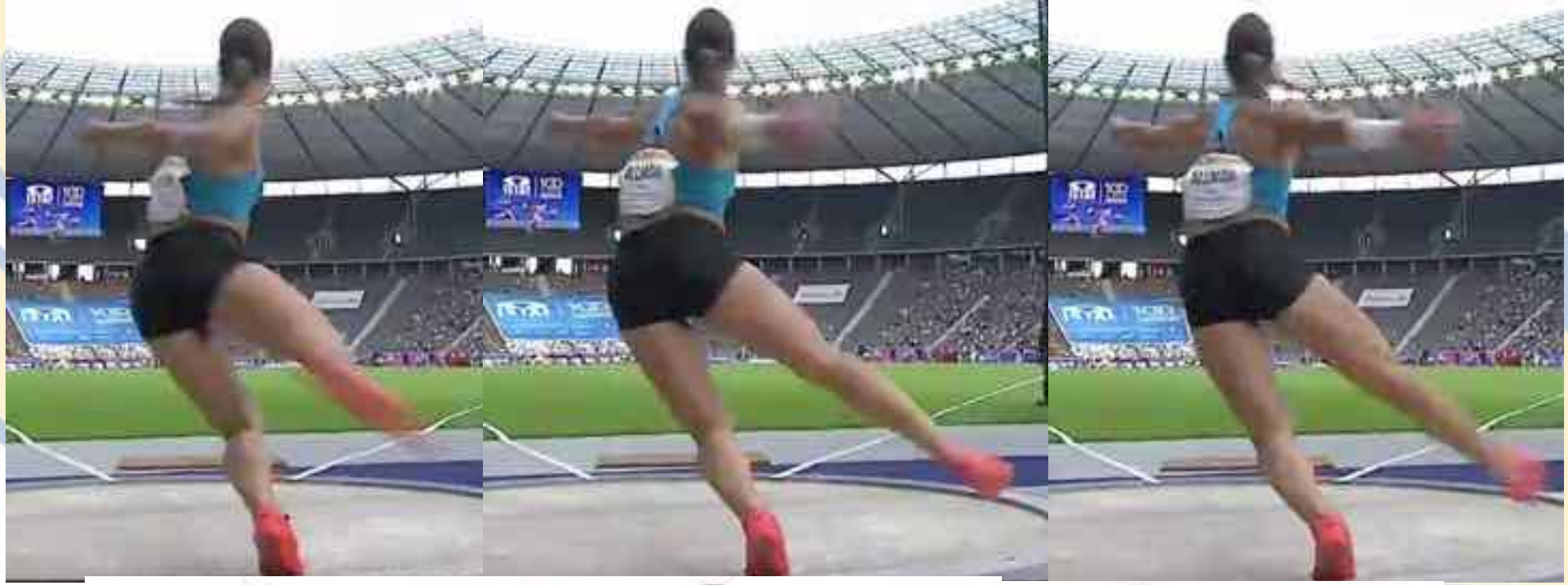
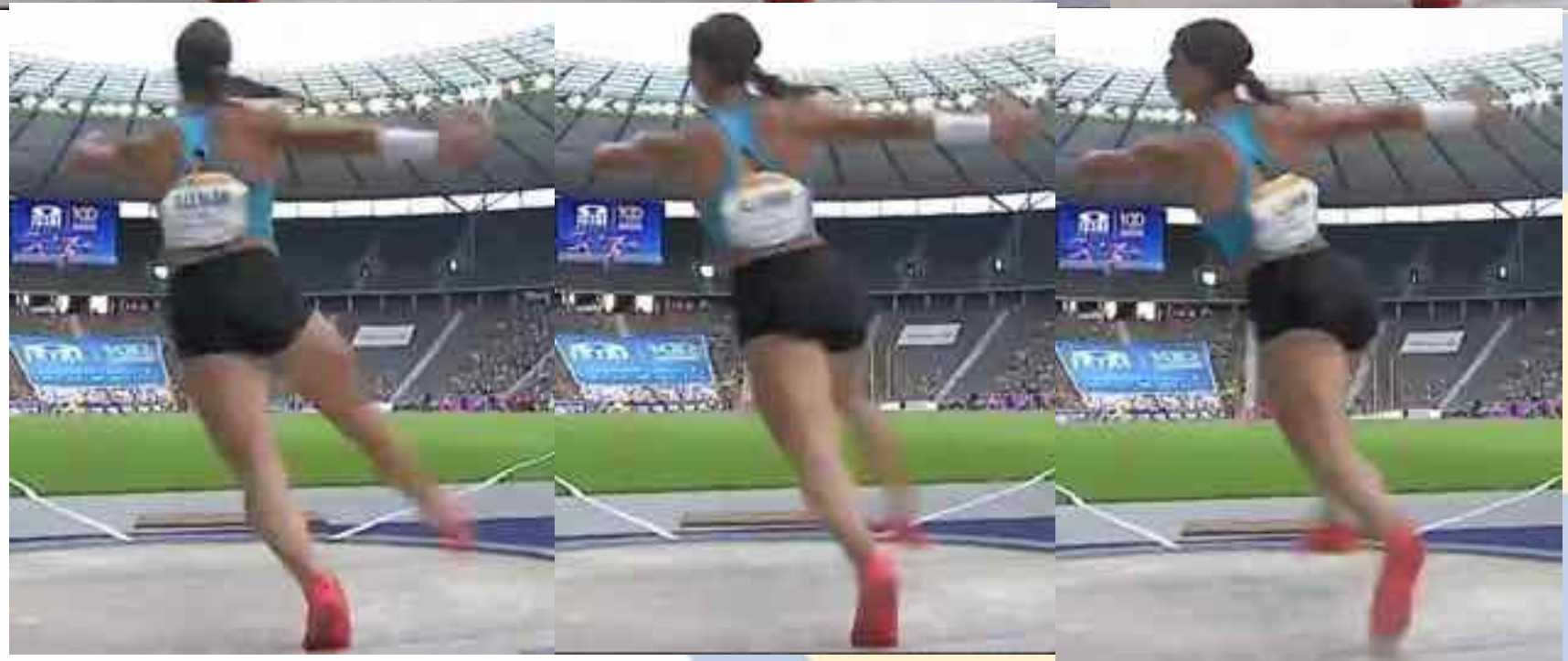
Entry Into The Ring

- When the eyes find the right sector line, sweep

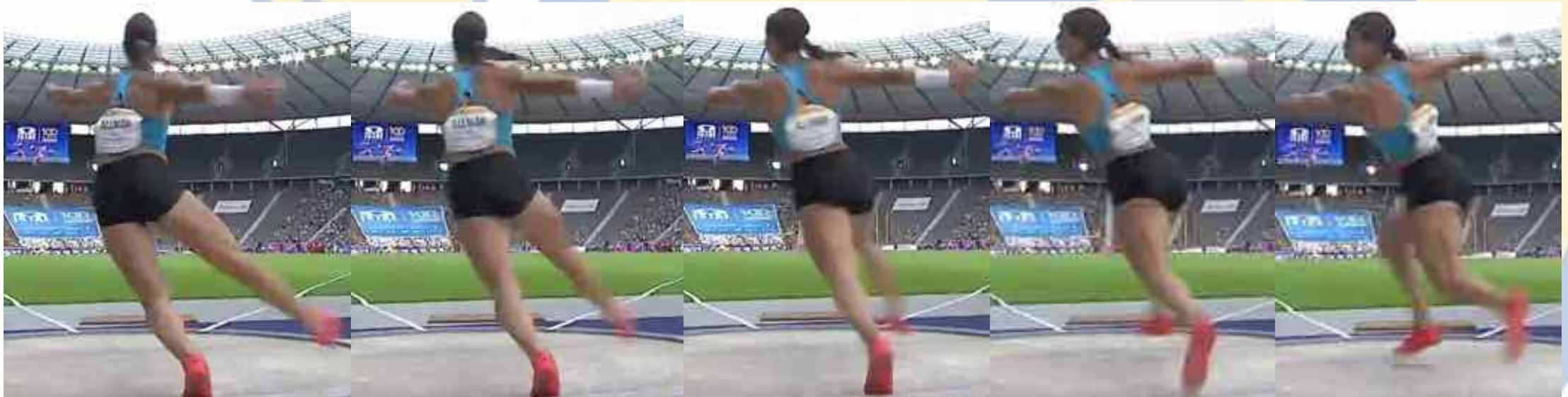
The Sweep

- The sweep consists of bringing the leg into the ring with the inside of the knee (MCL) as its directional focus– in a rotational manner
  - This enhances shoulder/hip separation (creates an “X”)
  - The purpose of the sweep is (at least) twofold
    - It continues the accelerating pattern of momentum development in a rotational path (not a reverse 7?!?)
    - Facilitates the hips moving in concert with the leg across the ring (COM a reverse 7?!?)

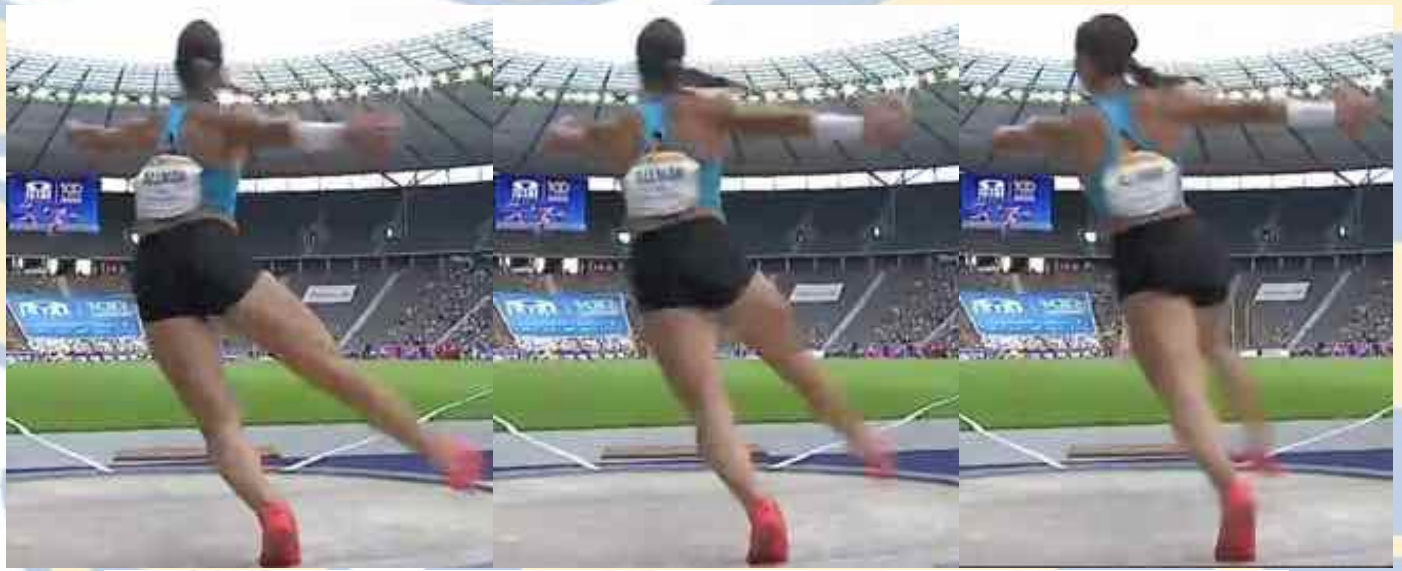



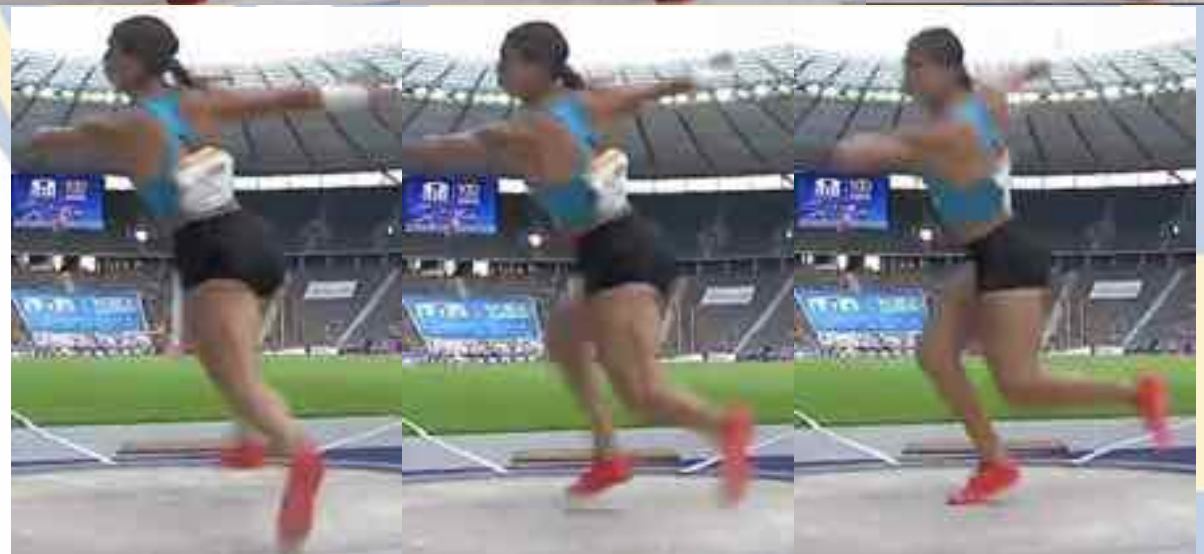
Non-Support (Sprint) Phase

- Once the sweep facilitates enough of an impulse to allow it, the left leg should be extended (ground the heel) in order to move the system in an efficient manner across the ring without inhibiting rotational momentum
  - Shoulders should be parallel
  - Hips should be relatively parallel

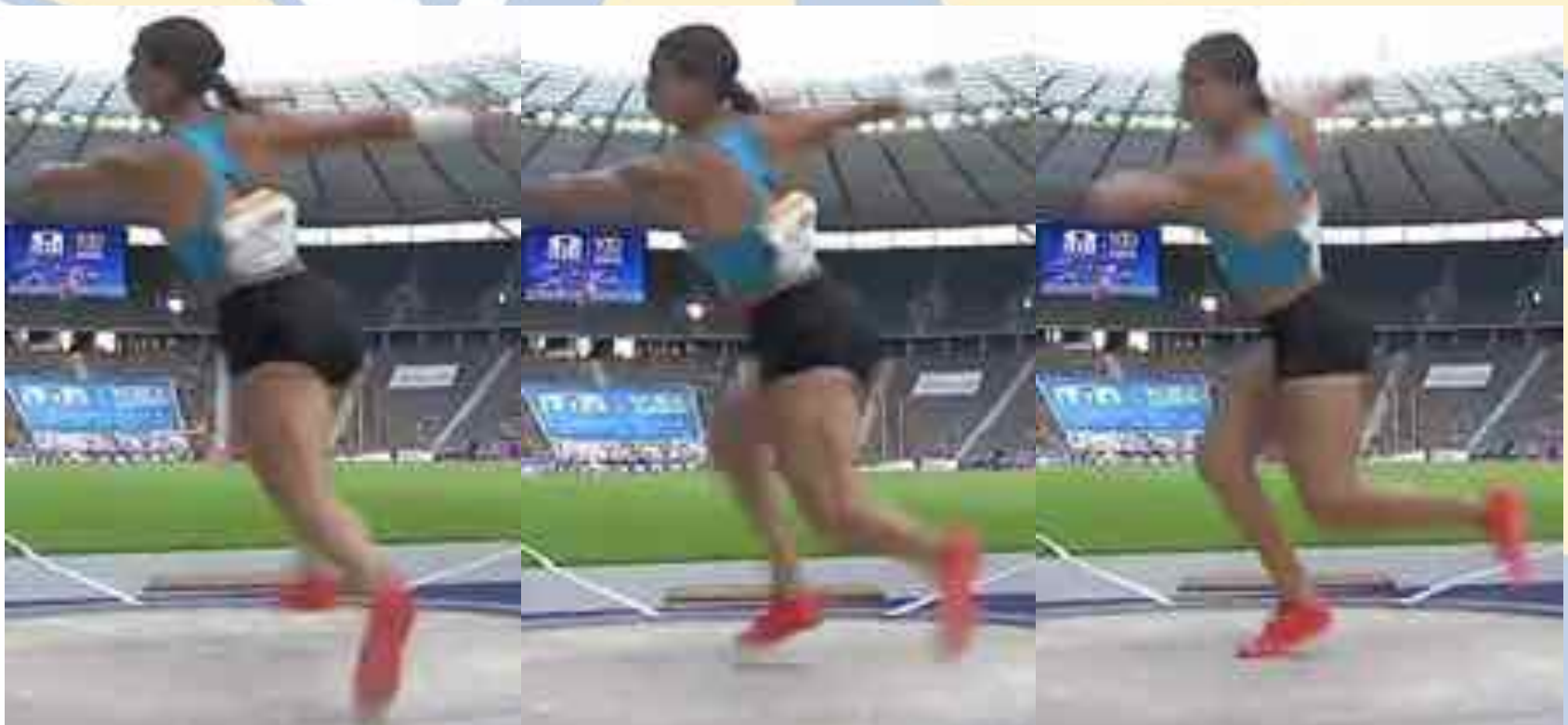


- Upper body “fixes” during this phase
  - Grabbing the pole with the left
  - Keeping the discus “out of the pocket”
    - Disc should be shoulder level and climbing toward its highpoint at the front of the ring

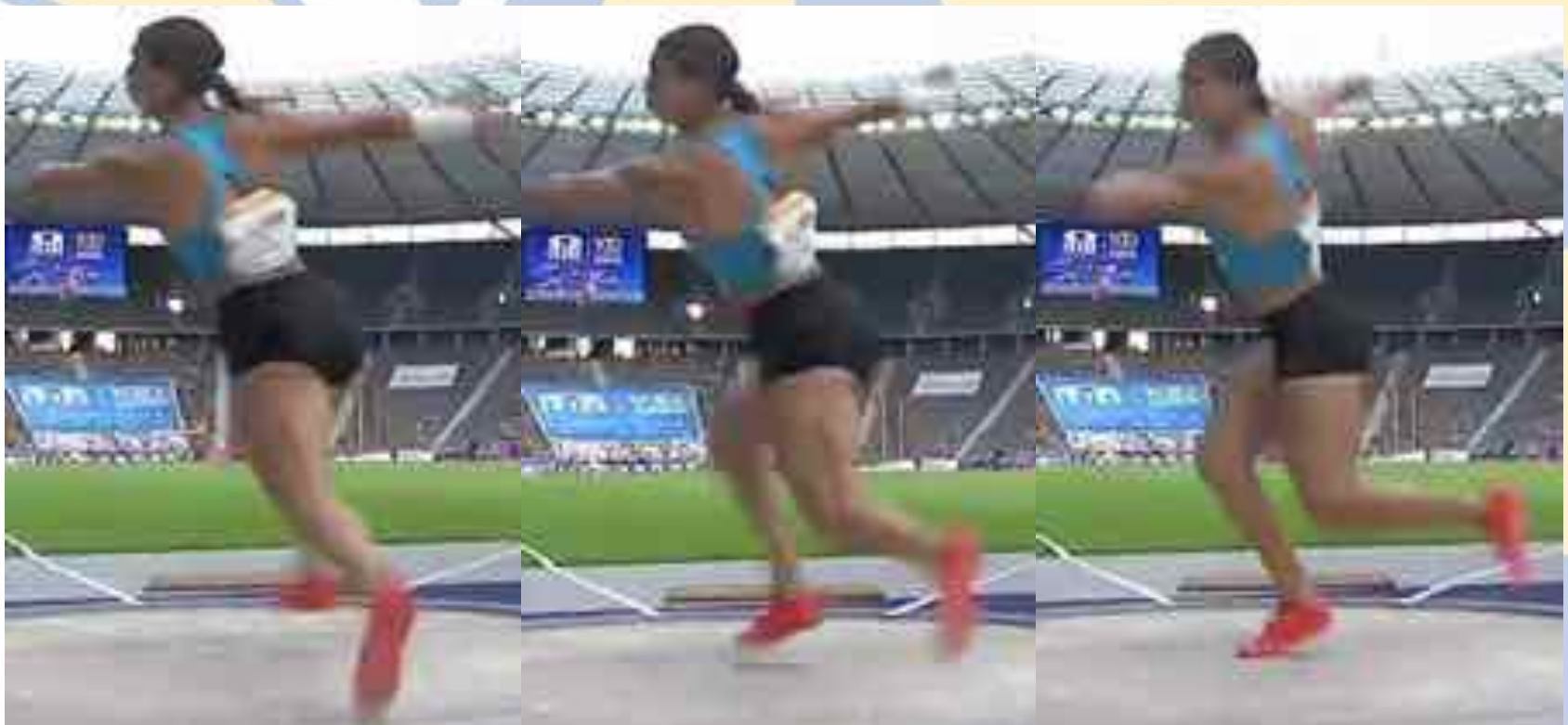




- Right leg has a dorsiflexed foot and an attitude of allowing the ground to come to it
  - DO NOT REACH

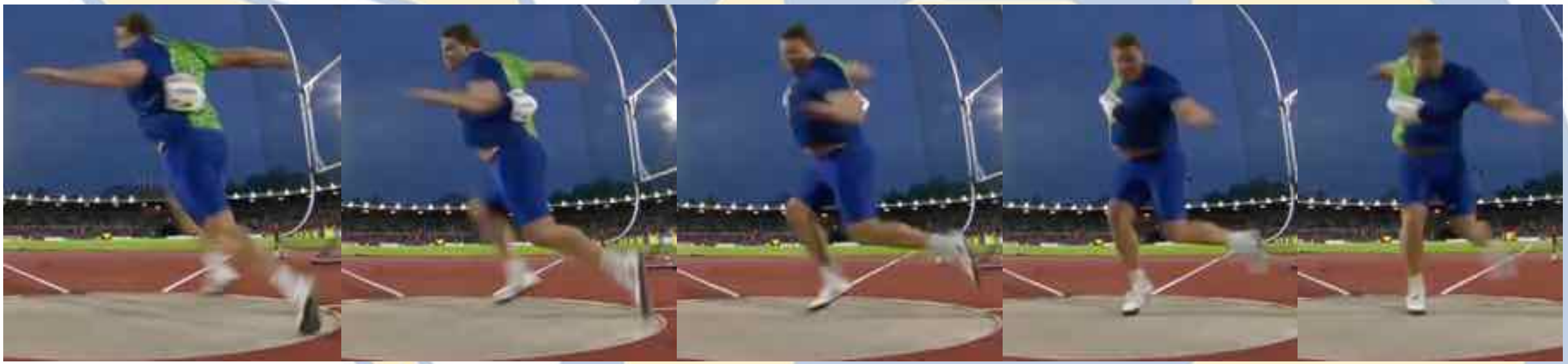


- Toe should point to roughly 10:30-11:00 on touchdown



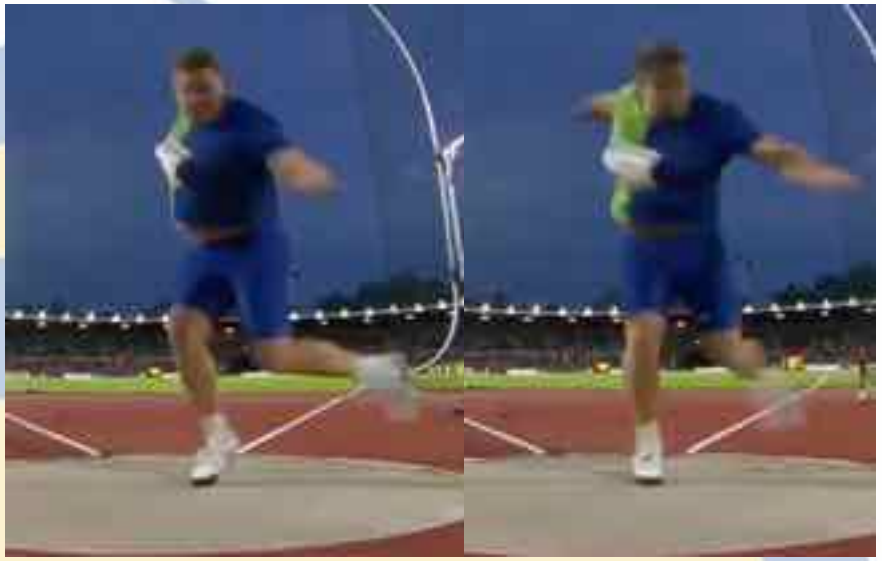
You can’t cheat the turn!

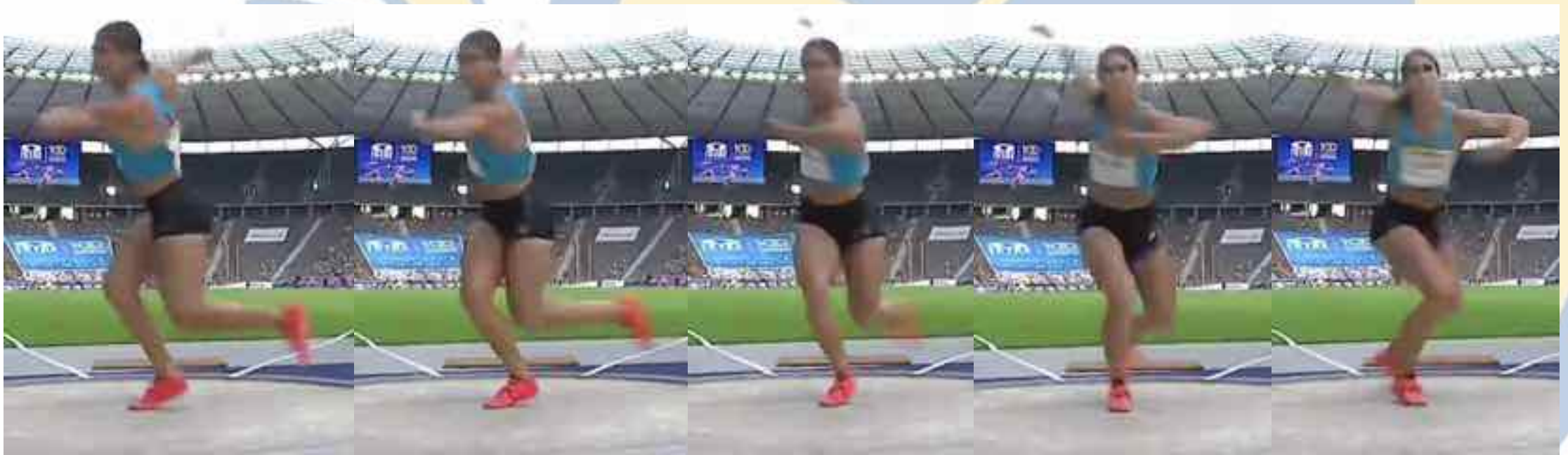
- Yes you can but you’ve got to have some extras



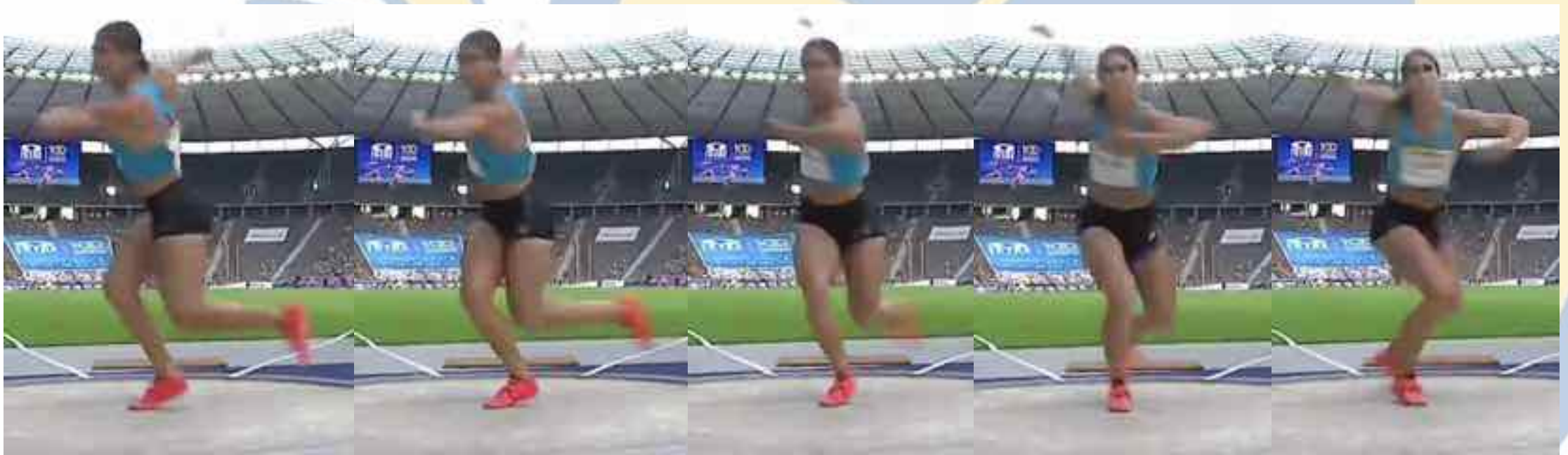
Right Foot Touchdown

- Axis of rotation is now the right foot/hip

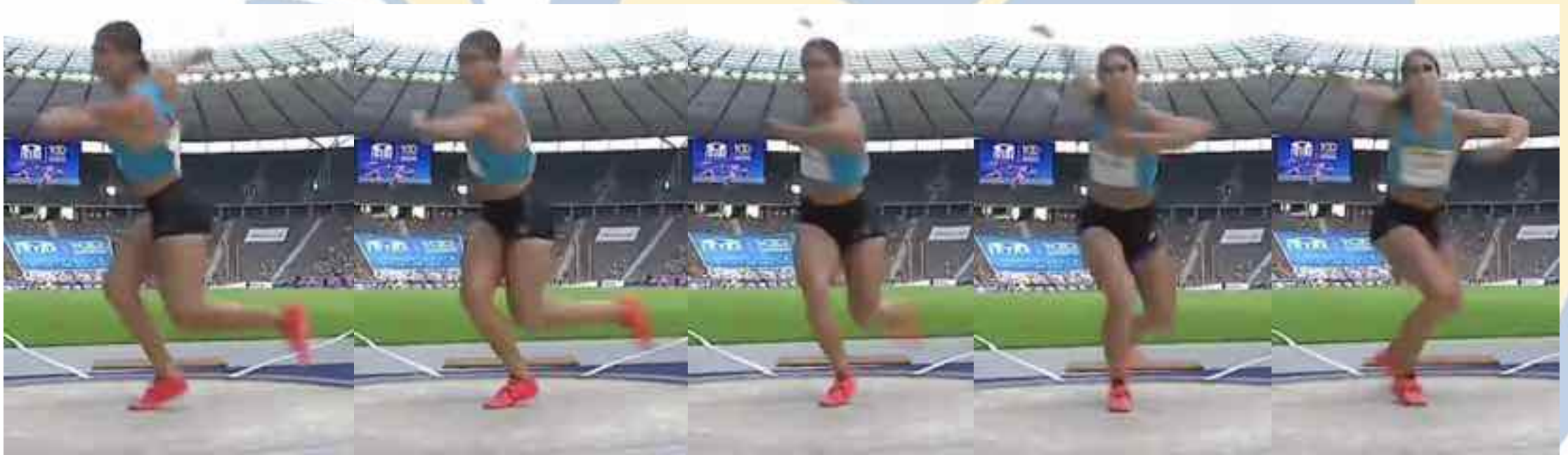




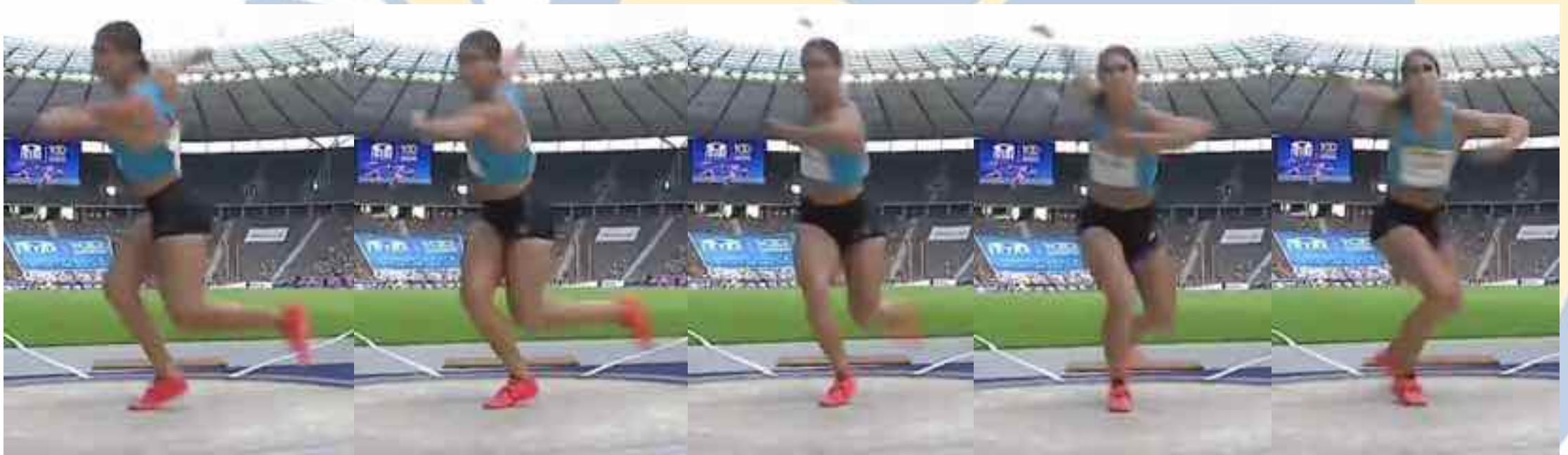
- There are some very important things to do upon right foot touchdown
  - Realize the thrower can do nothing to accelerate the approach AS FAR AS THE UPPER BODY IS CONCERNED until a return to double support
    - The throw can be destroyed and usually is at this point by the impatient thrower



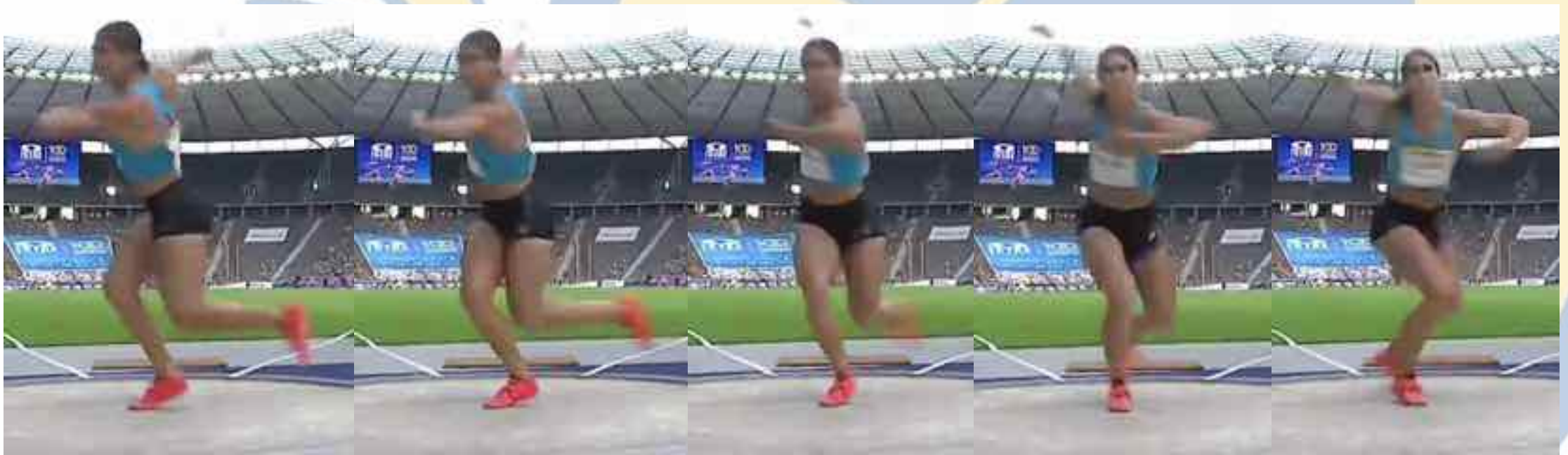
- Allow the disc to travel to its high point
- Keep as much distance (length of levers) between the hands as possible



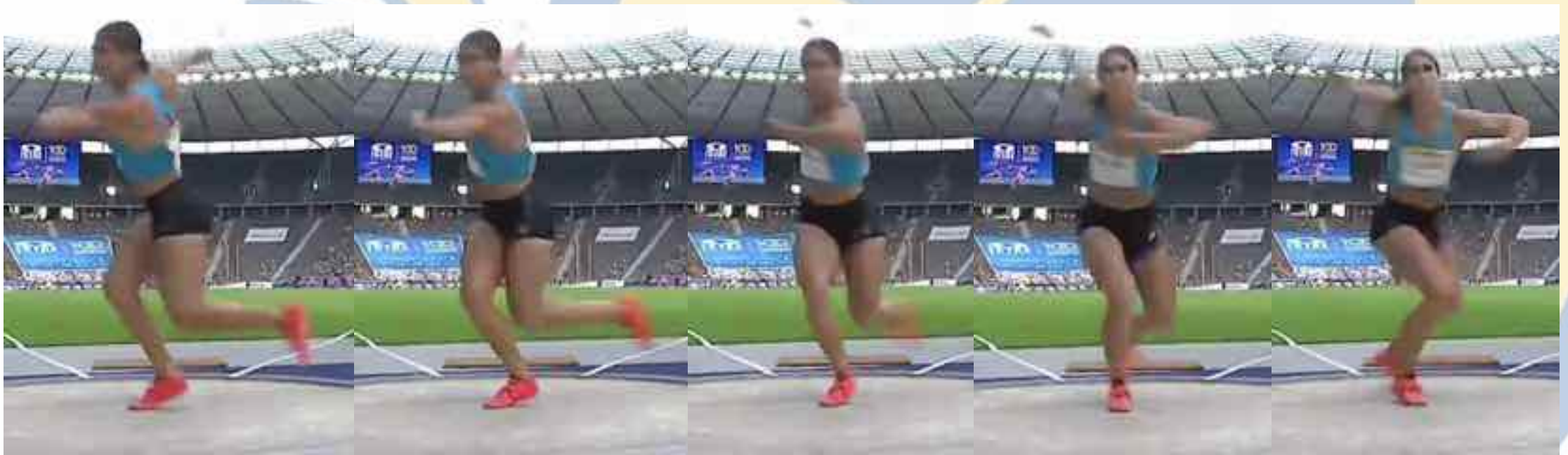
- Keep the left hand as far away from the right foot as possible



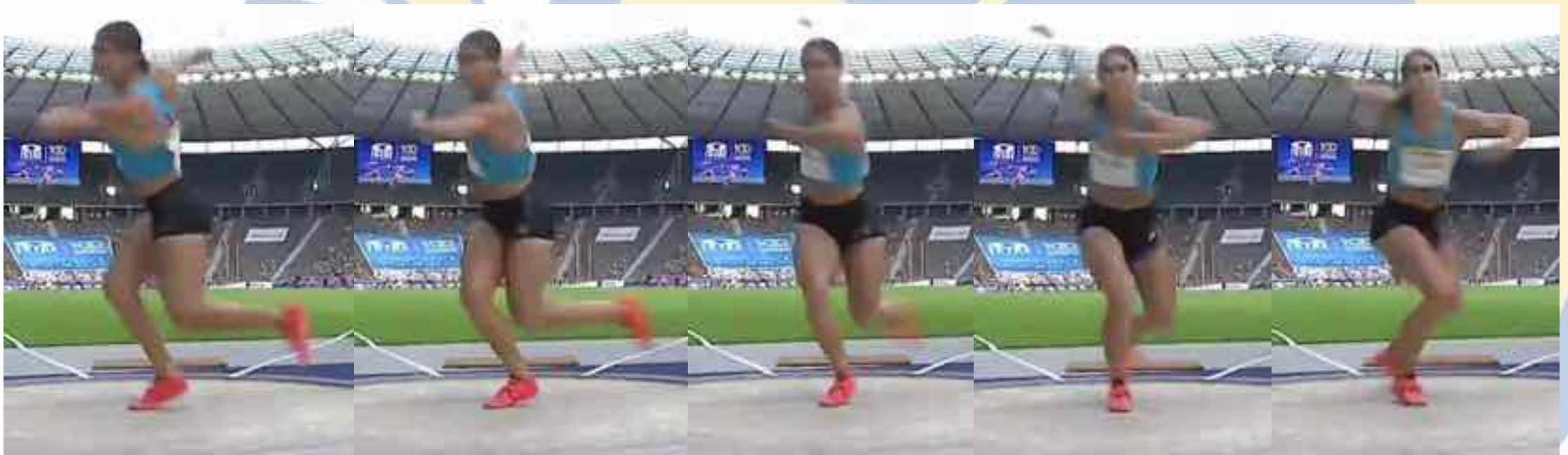
- The right foot (knee is a better cue) must move about the rotation as soon as possible



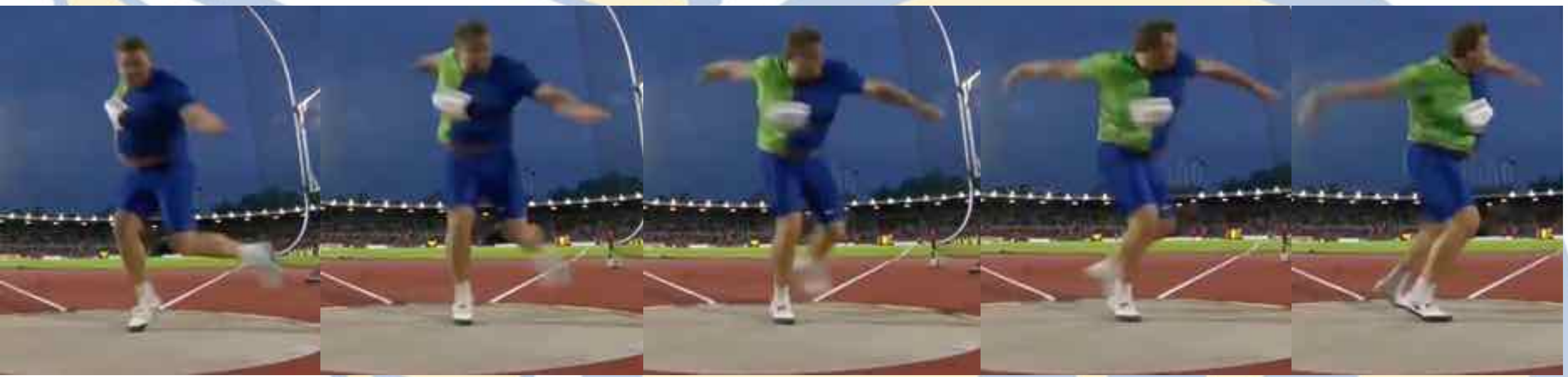
- The thrower must resist the desire to initiate the pull of the discus with the upper body until a return to double support.
- Upper body action prior to double support causes the system to move linearly and have weight/momentum shift toward the throwing sector



- Knock those knees together as you pull the left leg under and through to the front of the ring
  - Ice skater speeding up example
  - Take a peek at your shoelaces

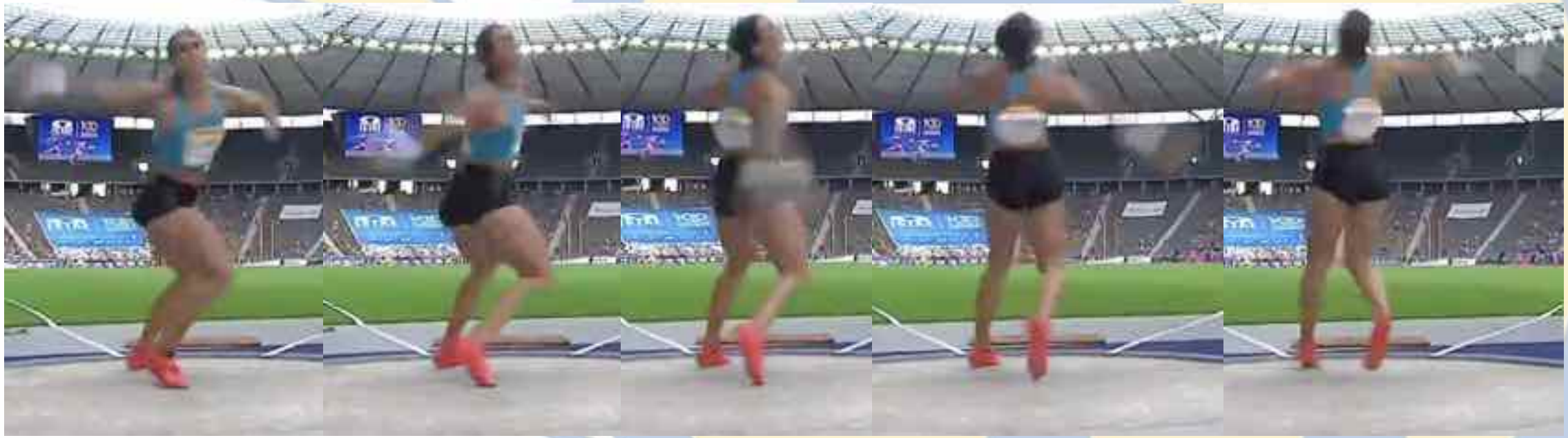


UNLESS

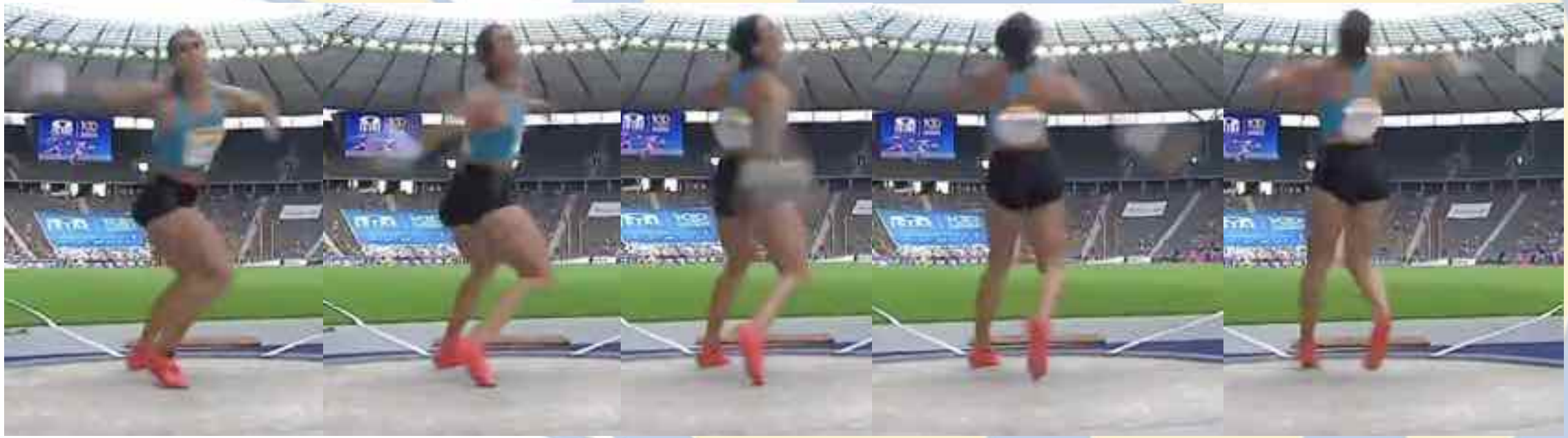


Left Foot Touchdown

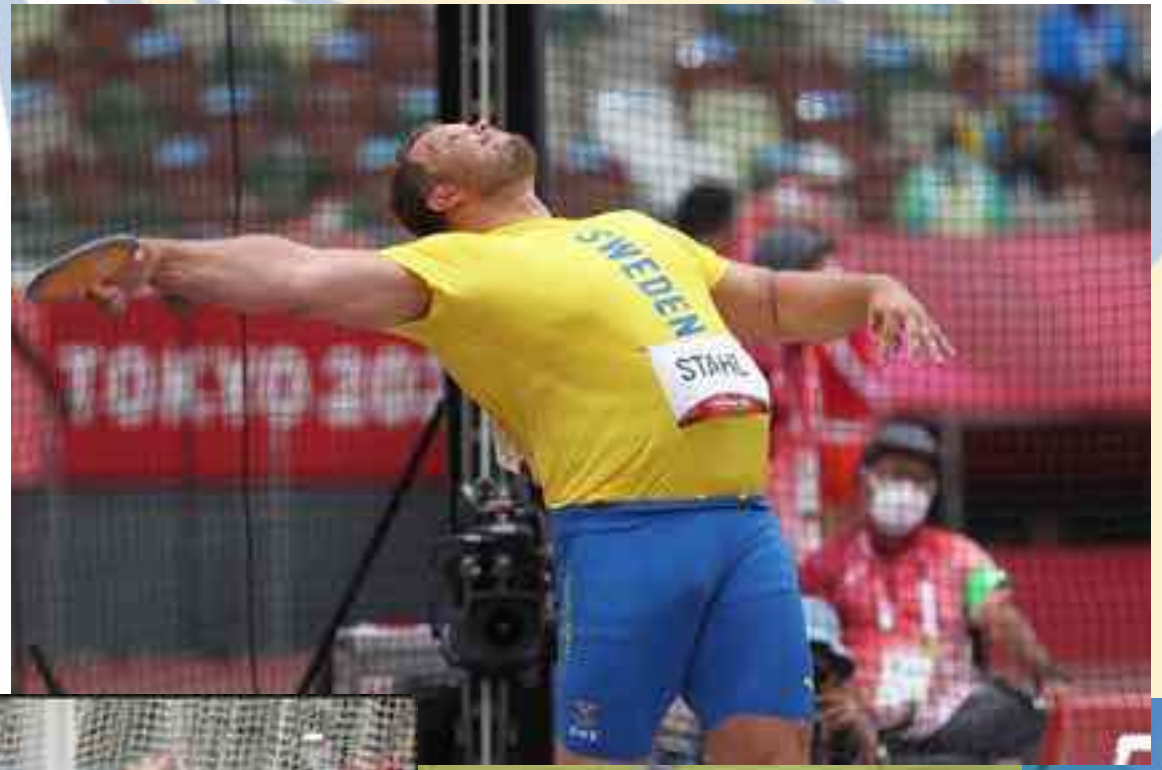
- Once the left foot has touched the ground and accepted some of the weight, slam the left hip backward/right knee around
  - All the while driving the hips up

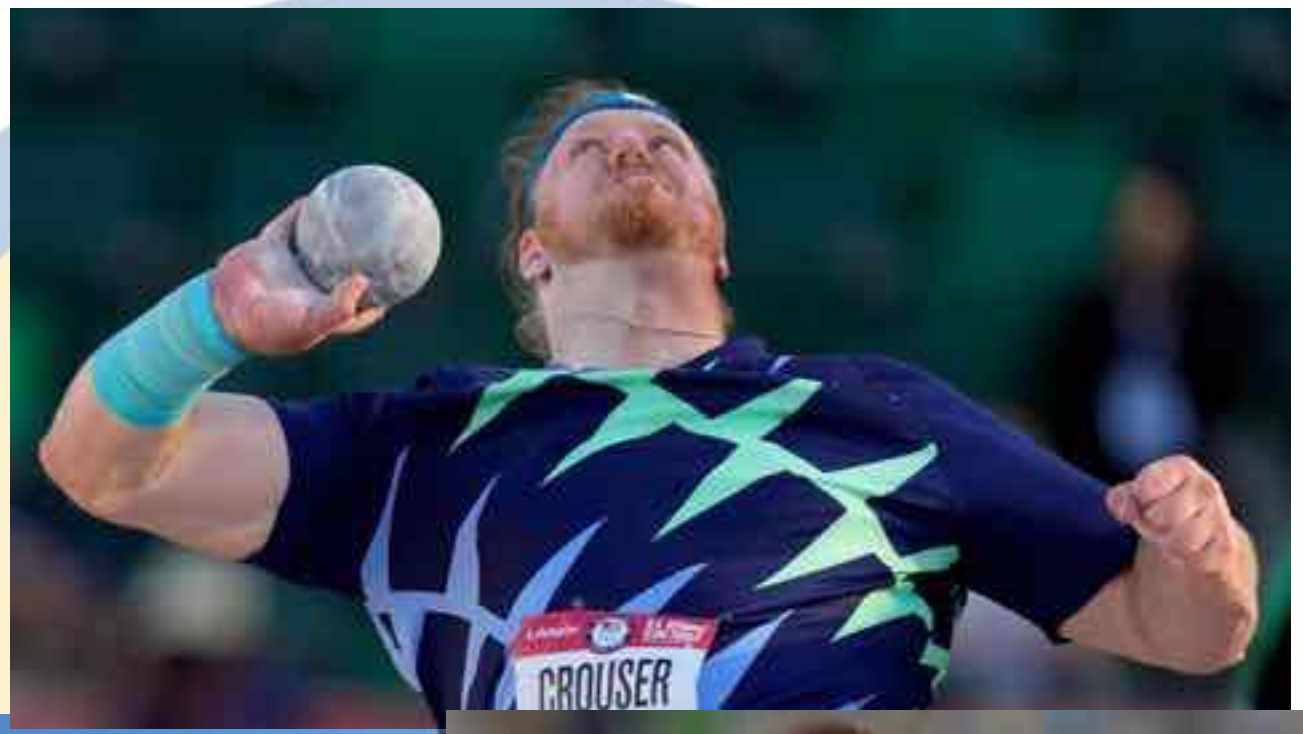


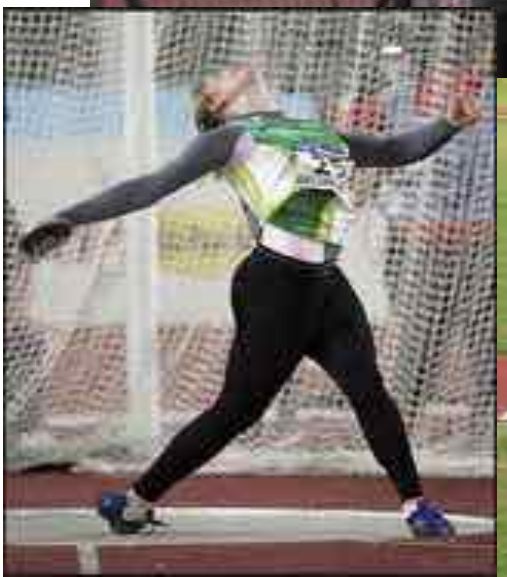
- The thrower should drive the chin up and away (do not watch the disc)

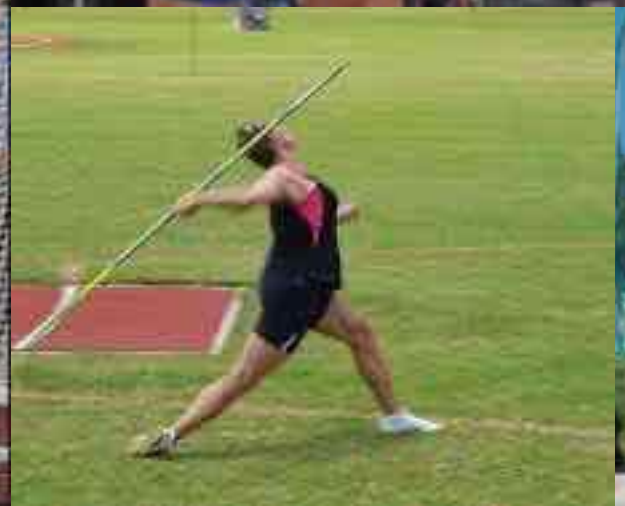


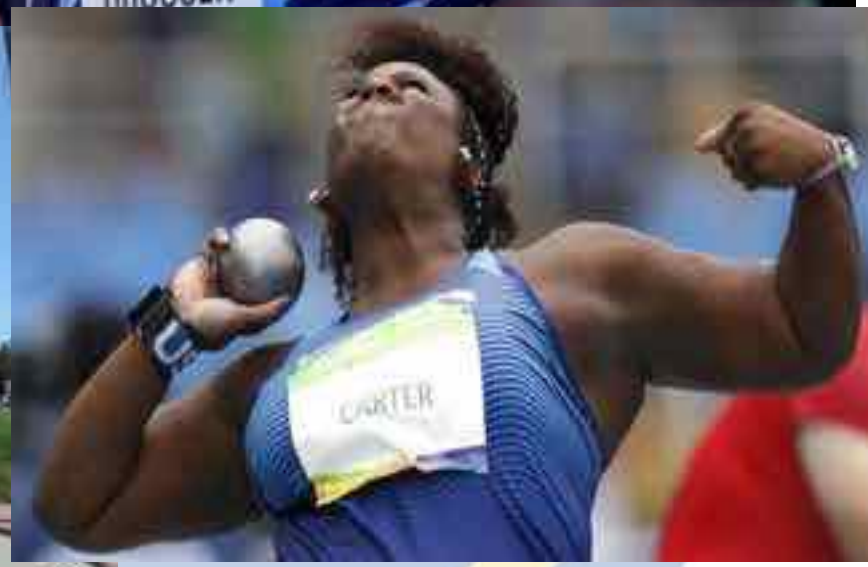
- The thrower should get their chest to the sky



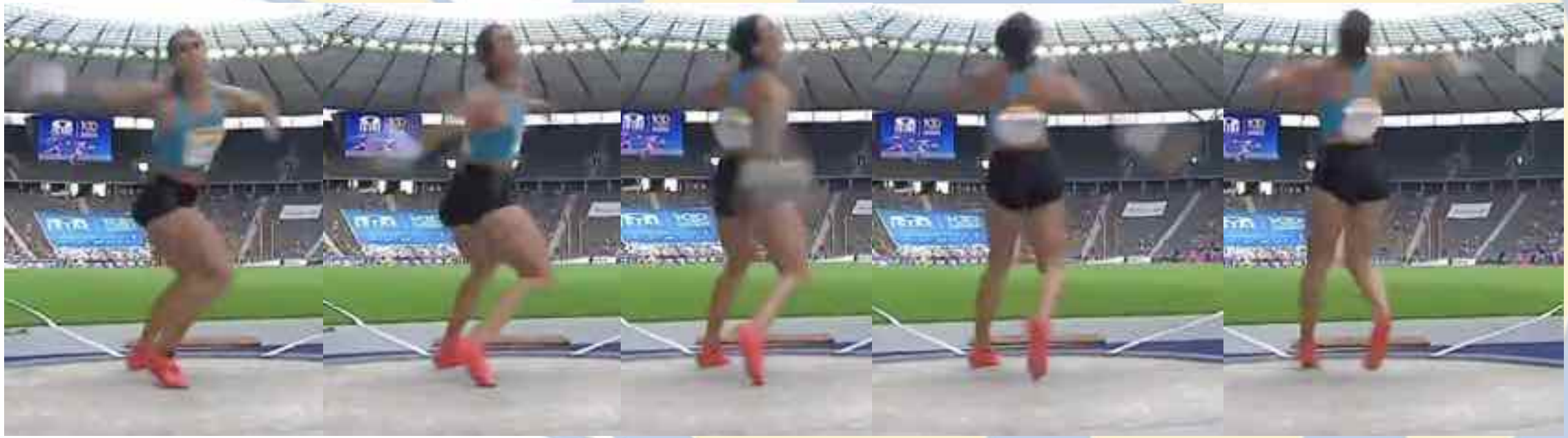


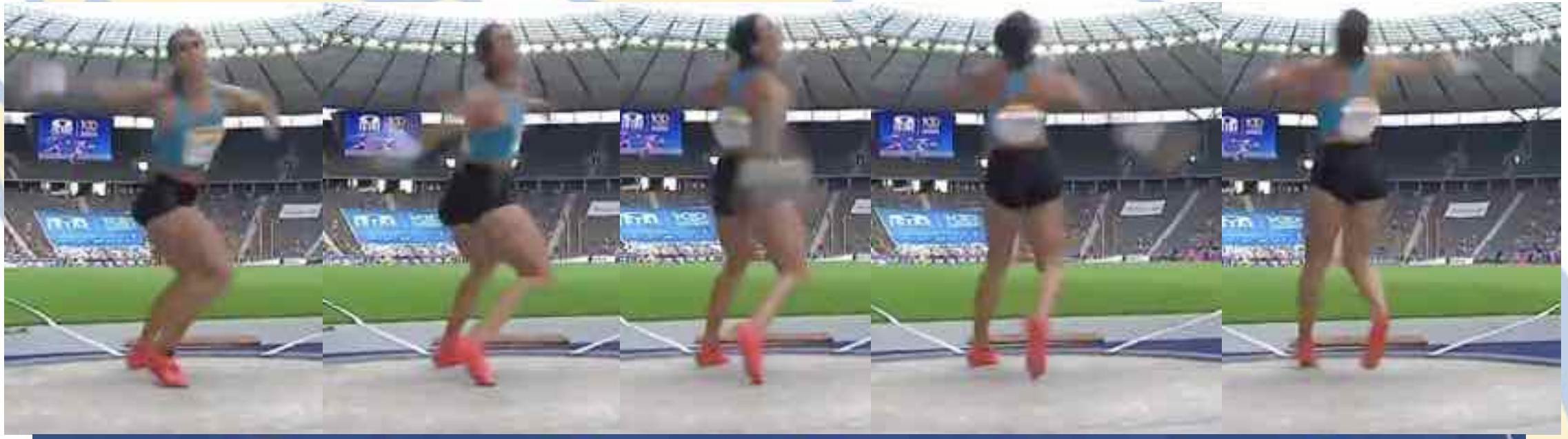


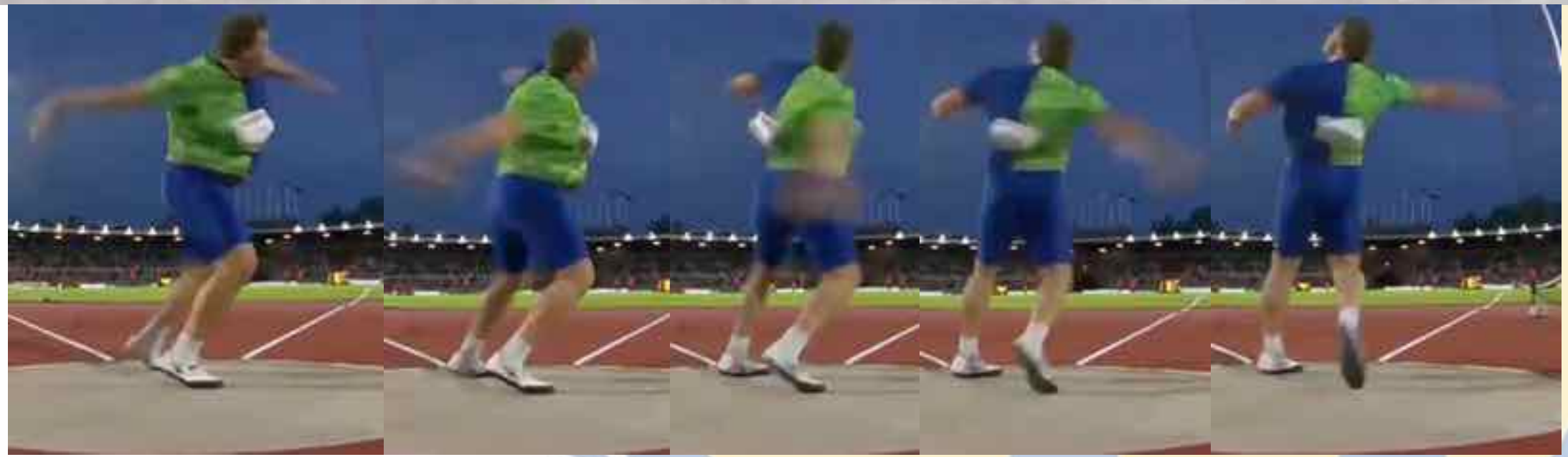




- The thrower should pull through the disc—Strike It!
  - Don Hood's "Bucket of Poo"
  - The throw should feel OUT and not UP







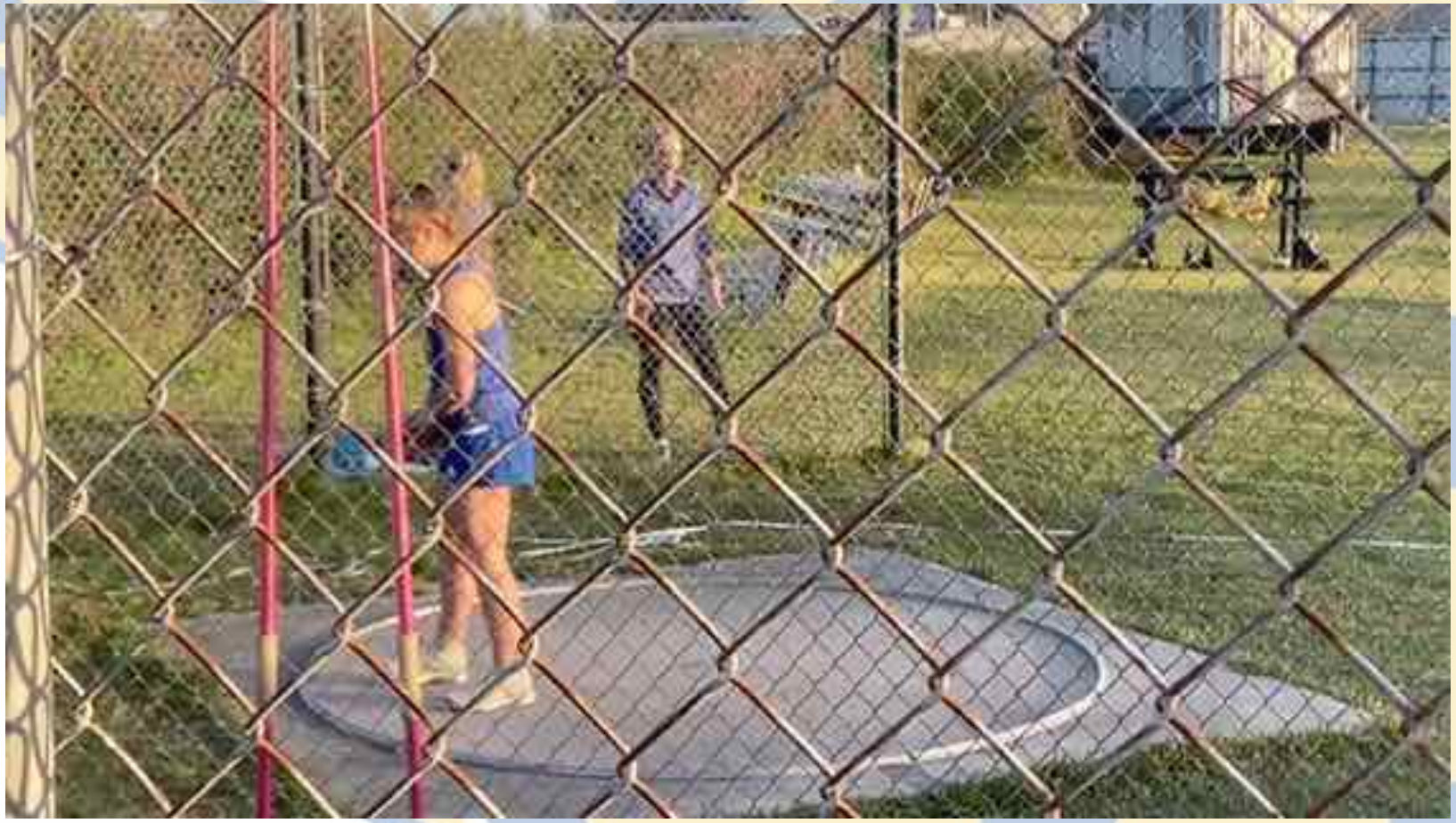
Finish and Follow Through

- Get your eyes to the back of the ring as quickly as possible
- Never watch the shot or discus (please watch the jav)

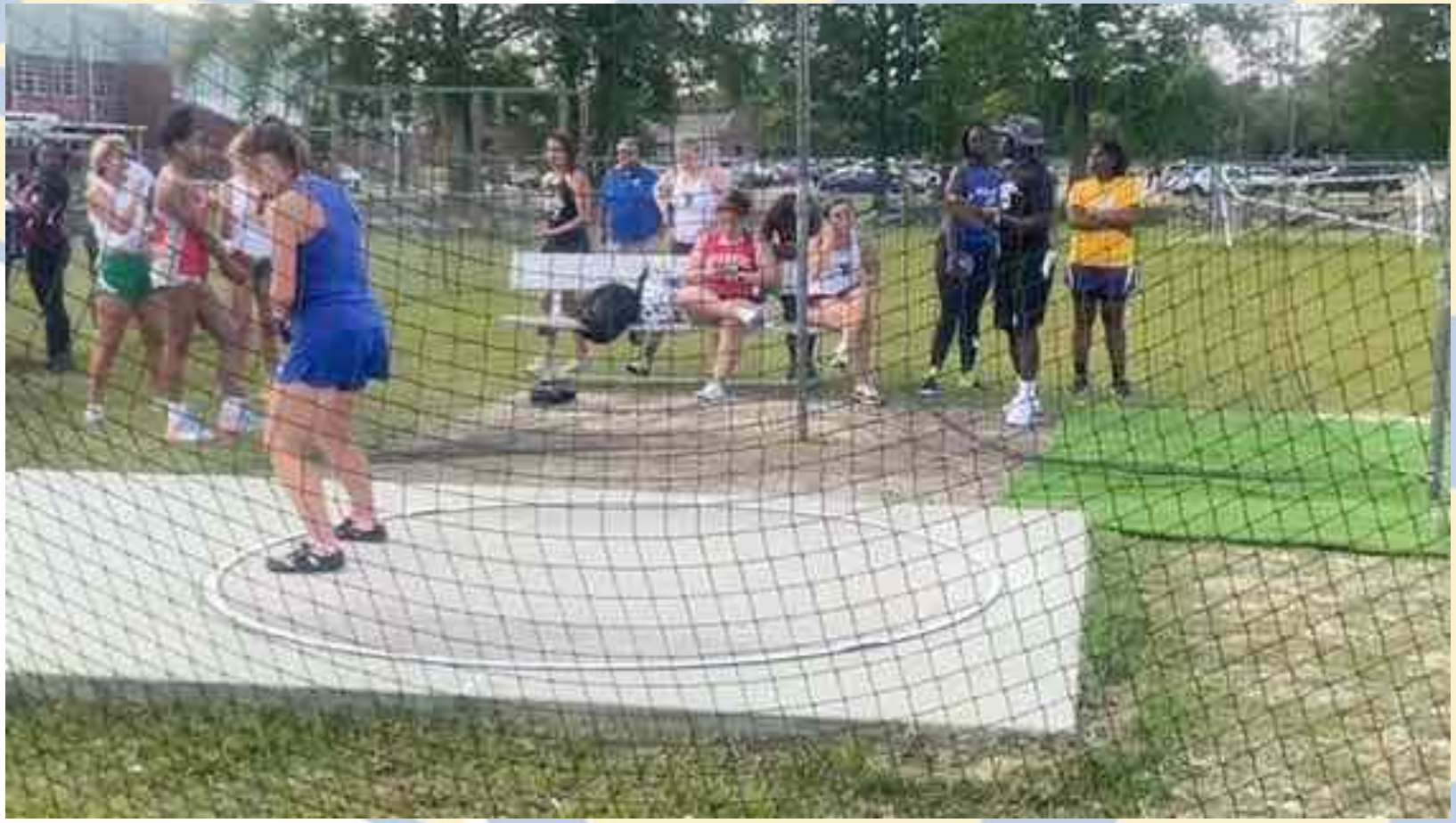
To Reverse or Not to Reverse

- Does the thrower maximize their hip/leg drive through the strike?
- Does the thrower transfer and turn OR transfer then turn?
- Does the thrower strike inside or outside of the plane of the ring?
- Does the thrower exhibit momentum in a linear or a rotational manner after the strike?
- Is the foul right foot forward or right foot around?
- Is the thrower watching the disc fly?

Reality (Meet #1, Throw #1)



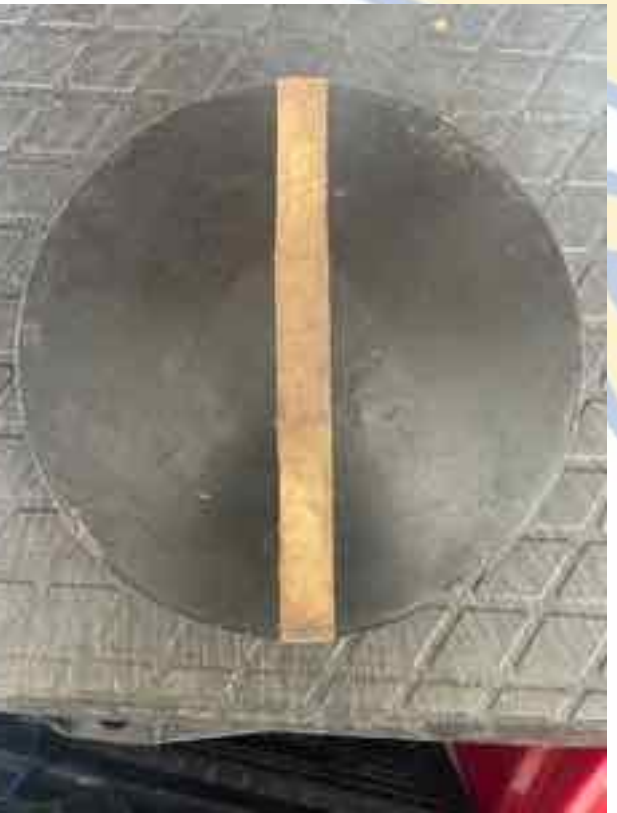
Reality (Last Meet of Season, Throw #4)

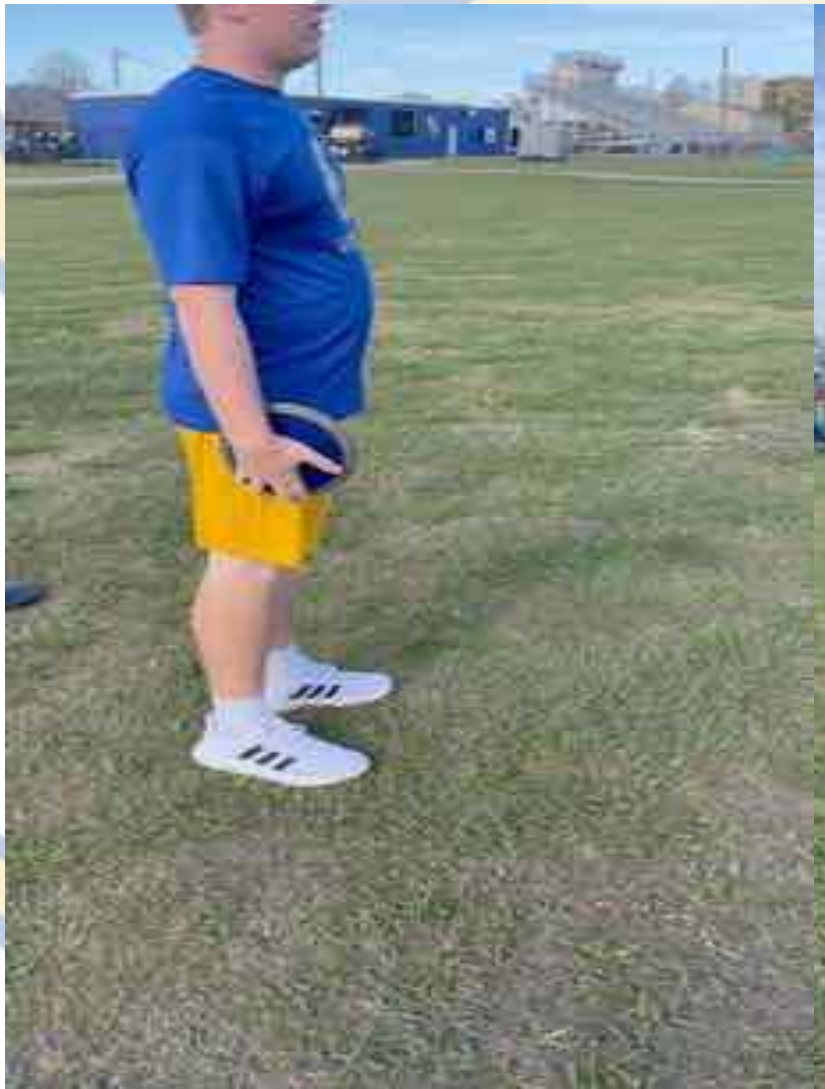


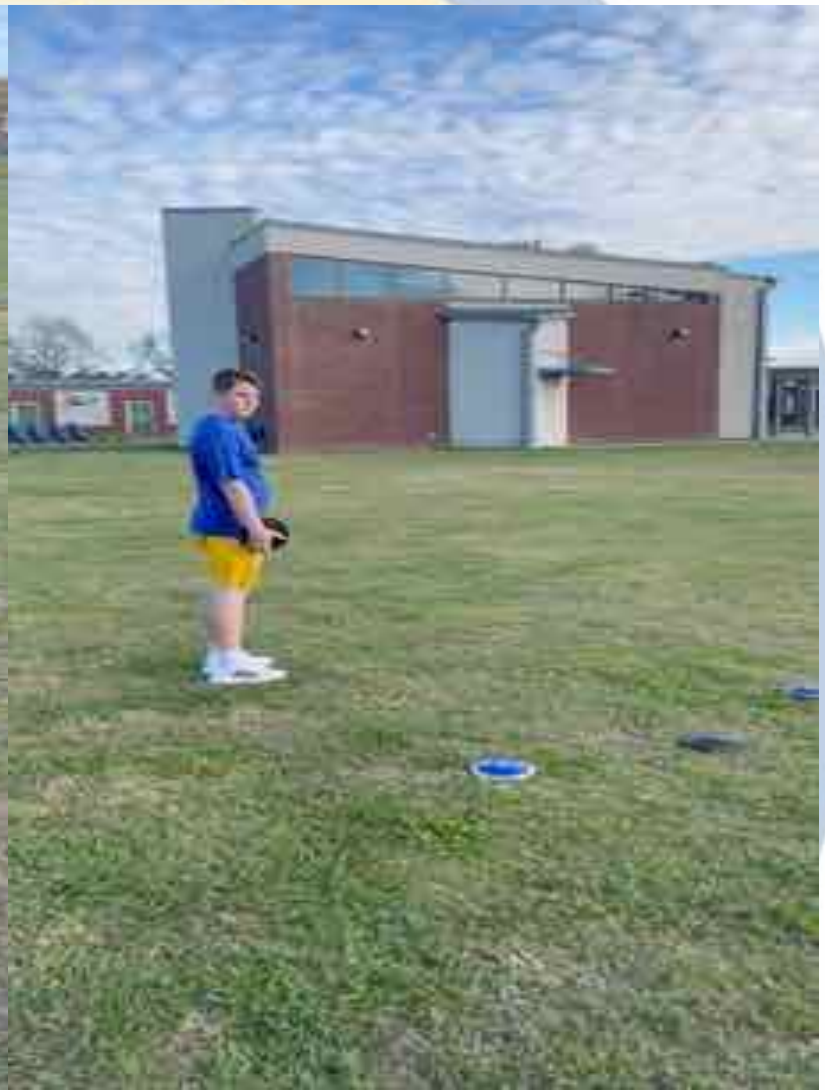
Day 1 All Throwers: Repeated Pivots

What do you do with the novice discus thrower on the first day?

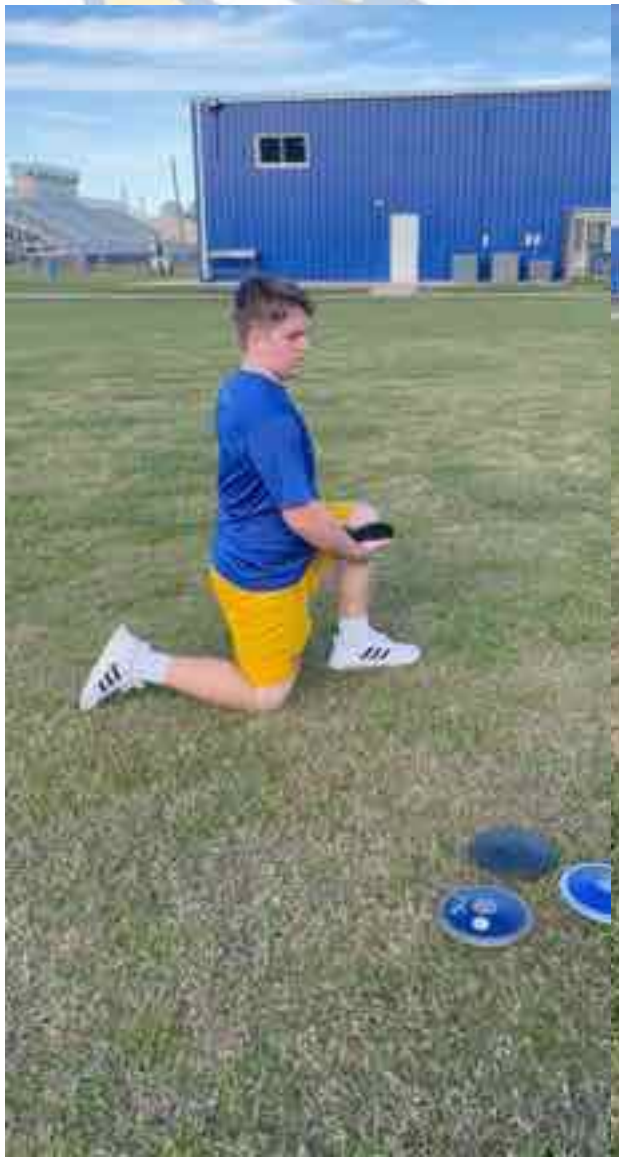
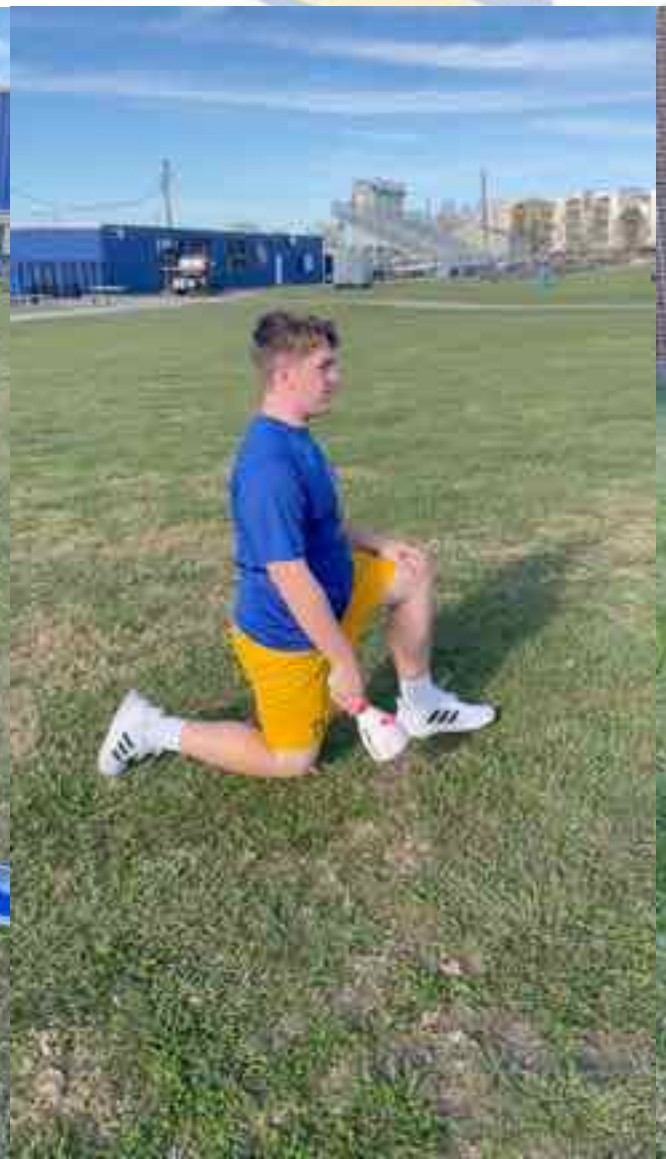
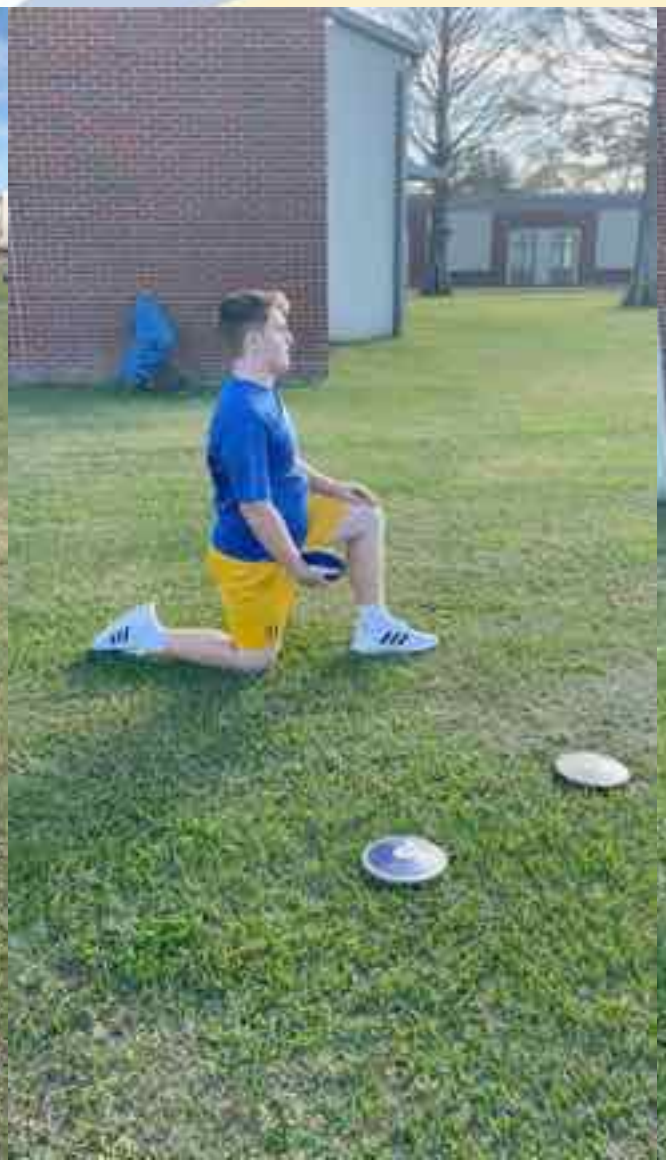
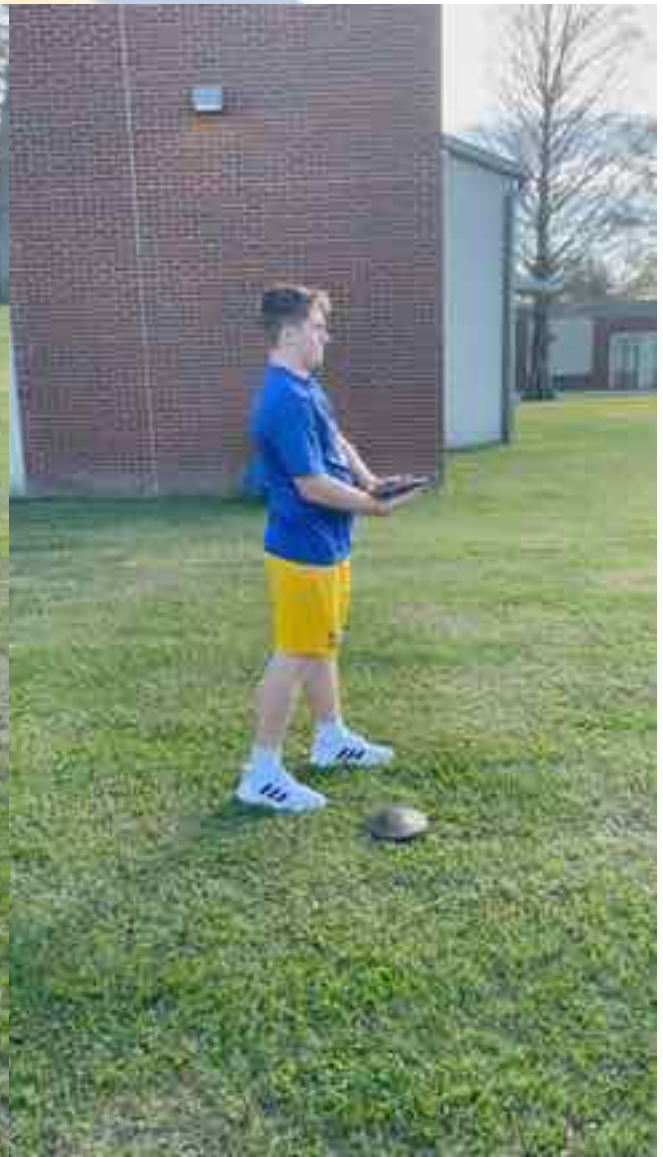
- Introduce Grip and release
  - Grip
  - Bowl
  - Vertical



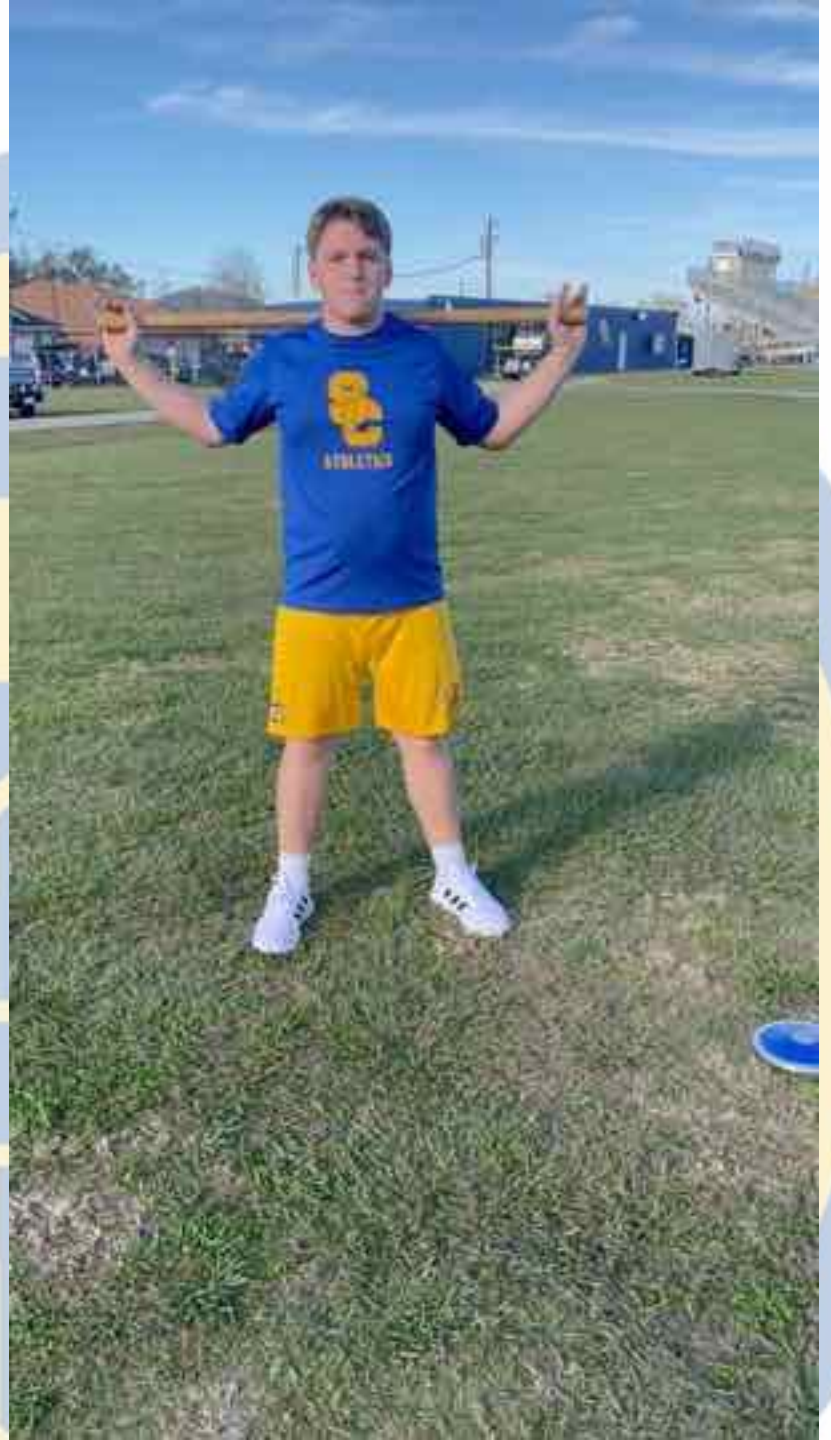




Introduce Separation

Introduce Transfer & Turn (include Power Position)



Advancing the novice thrower

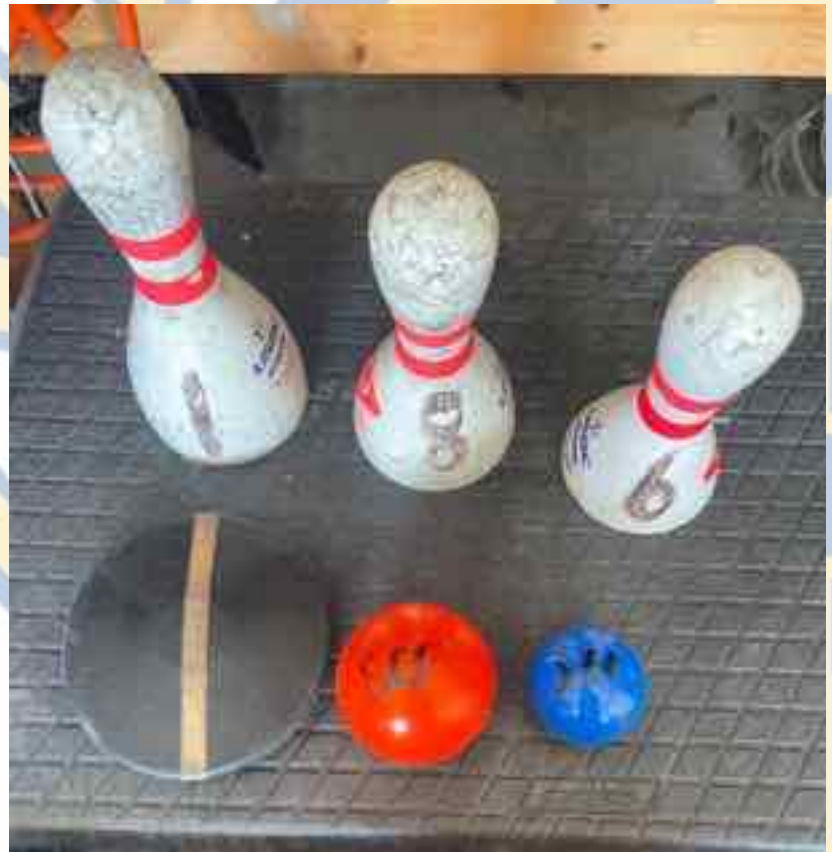
- Everyday
  - Front of the ring drills
  - Middle of the ring drills
  - Back of the ring drills
- Arete Throws
- Throws University
- You Tube

Approach Footwork

- Beginning
  - Counter move to quarter turn
- Middle
  - Quarter Turn to Giant Step
- End
  - Wheel
  - Power Position Throws

Do not allow dexterity with holding/releasing the discus affect any drill

- Use alternate implements
  - Cones, pins, towels, water bottles filled with sand, anything



Questions?

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