

# Flop High Jump Presentation

May 2023

## Safety and latest CARAs

### 1. Athletes involved

Assess athletes for any current illnesses or injuries (particularly knees, back, neck). Athletes should have appropriate footwear, which provides sufficient grip for running on curves, and for take off.

### 2. Equipment

- (a) if flexible cross bars are used in training, the uprights should be well anchored to avoid the possibility of the uprights being pulled down on top of the athletes;
- (b) solid cross bars – four metres long / circular cross-section / made of fibreglass
  - watch for cracked or split cross bars – injury is possible
  - landing on the cross bar - usually only causes bruising, even if it is initially painful
  - be wary of using so-called 'safety straps' around the end of the cross bar; they are supposedly designed to prevent the cross bar from falling onto the mats, but if the athlete 'crashes through' the cross bar, he can bring the uprights down on top of himself because the 'safety straps' effectively attach the cross bar to the upright
- (c) landing areas – the recommended minimum size is 5 metres by 3 metres. Even at elite level jumpers rarely land or even roll back as far as 3 metres. However, some athletes tend to 'sail along the bar'. It is advisable to have some extra gymnastics mats at the end of the landing area, if the landing area is only 5 metres long. 5 metre long mats only extend 50cm beyond the uprights at each end.

One way in which the 5m long landing area can be made safer is to use soft marker cones set up about 1.20m along from each upright, as shown in the photo below:



This will ensure that the athletes should take off no more than about 90-95cm along the bar. This will make their chances of clearing the bar near the centre, and decrease the likelihood that they might sail off the end of the mats.

**In the current CARAs (last updated 28 October 2021)**

<https://education.qld.gov.au/curriculum/stages-of-schooling/CARA/activity-guidelines/high-jump> for both medium risk **under 17** (scissors) and high risk **under 17** (Flop) high jump they refer to the [Little Athletics competition handbook](#) (Section 2.5).

In the latest Little Athletics competition handbook the high jump section is Section 2.3, where Section 2.3.2 states: U11 to U17 any legal jump technique (including scissor or Fosbury Flop): **onto appropriate thickness and density flop mats.** [*In the previous version of the Little Athletics competition handbook they had recommended a minimum thickness of 50cm for the Flop as well.*]

- Medium risk **17 years and over** — Padding 5m x 3m with thickness of at least 50cm.

Minimum padding dimensions determined by activity risk level and age group:

- High risk **17 years and over** — padding not less than 5m long x 3m wide x 0.7m high, as required by World Athletics - book of rules - book C: competition (C2.1 -Technical Rules - TR27.10).

As shown in the photos below, if mats are of only 40cm thickness, they can be brought up to 55cm thickness by placing them on top of scissors mats (thickness 15cm)







If there are concerns that the top mats might slide across the bottom mats, they can be secured to each other with a carabiniere (as shown in the photo above), or by tying the carry handles to each other (you can see in the photo above that the carry handles are one above the other)

- (d) uprights should have a heavy enough base to prevent them from falling over when the bar is knocked, or should be anchored to the ground. The base should not project out into the run up area.

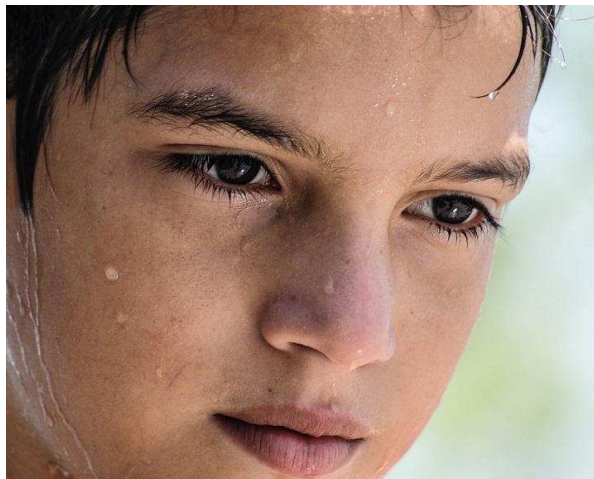
### 3. Technique

Poor technique can possibly cause injuries – to the neck, lower back, foot, knee or groin area. Consequently, good technique can assist in minimising the risk of injuries.

### 4. Environment

Some things to consider regarding environmental factors:

- Consider whether the run-up and/or take off areas are slippery
- Temperature / sunshine. High jump competitions can last a long time. Take the usual precautions regarding high temperatures and sun exposure, e.g. Is there sufficient shade? Do the athletes have ready access to water? Do they have, or have access to, sunscreen? Consideration should also be given to temperature when the day is cold.



## Rules

A few new rules have been introduced over the last few years:

Rule 26.8.4 (which refers to separating a tie for first place by conducting a jump-off)

If it concerns the first place, a jump-off between these athletes shall be conducted in accordance with Rule 26.9 of the Technical Rules, unless otherwise decided, either in advance according to the regulations applying to the competition, or during the competition but before the start of the event by the Technical Delegate(s) or the Referee if no Technical Delegate has been appointed. If no jump-off is carried out, including where the relevant athletes at any stage decide not to jump further, the tie for first place shall remain.

Rule 27.2.3 (which refers to the how an athlete is deemed to have failed an attempt)

An athlete fails if:

27.2.3 They touch the crossbar or the vertical section of the uprights when running up without jumping.

Rule 25.17 (which refers to Time allowed for Trials)

Note (iv): When only one athlete (who has won the competition) remains in High jump or Pole Vault and is attempting a World Record or other record relevant to the competition, the time limit shall be increased by one minute beyond those set out above.

## Some basic biomechanics

### How to get the back to the bar:

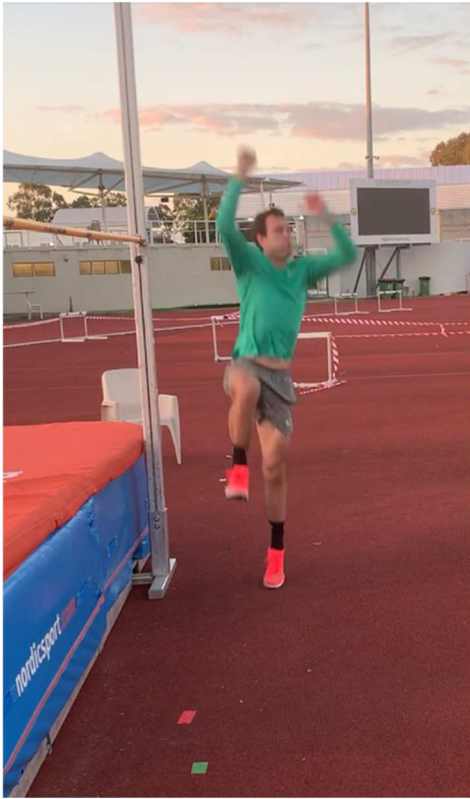
'Sumo' drill:

At foot plant for take-off the take-off foot should be facing in the direction of travel (which should be directed through the bar at approx. 25 degrees to the plane of the uprights). A good drill for this (and for the rotations about the longitudinal axis of the body which follow) is the 'Sumo' drill.

The athlete does a few steps along in front of, and parallel to, the crossbar. The take-off foot should be planted facing the direction of travel, as shown in the photos below.



The leading knee, hip and shoulder should move forwards along the bar rotating around the vertical (longitudinal) axis of the body. There should be no turning of the take-off foot away from the direction of travel until after the athlete has left the ground. There should be NO pronounced drive of the free leg, or of the lead arm, away from the bar - see below.



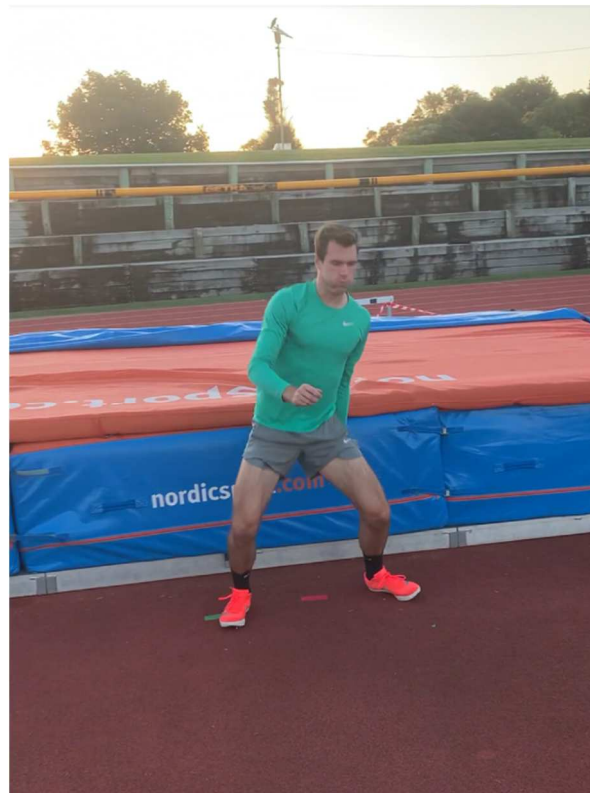
At the time the shoulder blades reach the height of the bar they should be parallel to the bar.





When landing from this drill, the knees and feet should be turned outwards, almost to 45 degrees, similar to the leg position when doing a Sumo squat in the gym.

Practising getting into this position helps later when the athlete is trying to learn how to get into the 'frog' position on top of the bar.

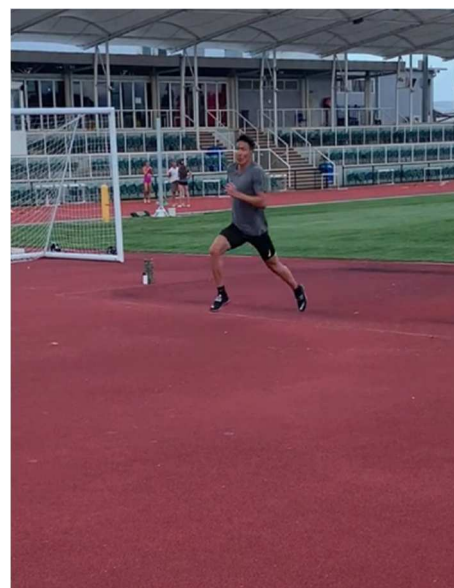


### Why a J-shaped curve?

The first part of the run-up should be straight as it is easier to develop speed when running in a straight line. The approach to the bar is then curved so that at foot plant the body can be leaning away from the bar, and a hinge moment is created by the foot plant for take-off.

### Some key elements of technique

Body posture. From the beginning of the curve the athlete should be 'running tall' (not leaning forwards). The head and shoulders should be aligned above the hips, and the hips above the foot (including while leaning into the curve).





The lead shoulder should be held higher than the inside shoulder.

In the photo at left the athlete can be seen leaning into the curve although the straight line from the top of his head to his foot could be better. This would also improve the height of the right shoulder relative to the left one.

The forces going through the ankle and the foot can be seen quite well in the photo of the athlete as he runs through the curve.

Good foot and ankle strength is essential for being able to withstand the large forces generated during the curve and through take-off.

It is important that the athlete stays on the curve until foot plant (watch carefully for the penultimate foot plant to ensure that there is no stepping out from the curve, especially on the penultimate foot plant).

The photo at left shows the pre-penultimate foot plant

In order to prepare for take-off there should be a lowering of the centre of mass. This is partly achieved by having a good lean away through the curve. However it is enhanced by having a flat-footed landing for the two foot plants before the take-off foot plant.

The photo above showed the pre-penultimate foot plant (left foot). The photos below show the penultimate foot plant (right foot), and the foot plant for take-off (left foot). As can be seen in the photos, each of these foot plants is flat-footed.



The take-off foot should be planted with an 'active' action in front of the hips. At the moment of foot plant the knee of the 'free leg' should be about level with the knee of the take-off leg.

The take-off foot should be directed through the bar at approximately 25 degrees to the plane of the bar. The knee of the take-off leg should be unlocked but with minimal further flexion (the amount of further flexion will depend largely on the strength levels of the athlete). These points can be seen quite clearly in the photo at the right on the previous page.

What should also be noted in that photo is the distortion of the take-off foot due to the large forces being generated, and also the fact that the athlete has maintained his lean away right until the moment of planting the take-off foot.

The body will now start to rotate around the foot and this rotation will continue as the athlete leaves the ground. This is known as a hinge moment.

At the moment the toe of the take-off foot is about to lose contact with the ground the athlete's body should be vertical (as shown in the photo at right).

The rotation created through having a lean away at the foot plant for take-off continues as the athlete leaves the ground. The body rotates through the longitudinal axis (as described earlier for the 'sumo' drill). This brings the back to the bar for bar clearance.

On the way up to the bar the athlete wants to rotate slowly. You can see the athlete at right starting to extend the arms high above the head creating a long thin shape on the way up to the bar (long levers rotate more slowly than short levers).

On top of the bar the body's levers need to be shortened to quicken the rotation speed over the bar. Bring the hips up to the hands, turn the knees outwards while keeping the heels close together and pull the outside of the calves towards the shoulder blades ('frog position').



In the photo at right the athlete has brought his left arm close to his body, and his right arm has been bent to shorten it. He has shortened his legs by turning his knees out and bending his knees while keeping his heels close together (the 'frog' position).

Once the bar has been cleared the athlete can extend the arms and legs to slow down the rotation towards the mats.

An excellent video which demonstrates the hinge moment can be found on YouTube at:

[High Jump Hinge Moment Demonstration with Stefan Holm - YouTube](#)





A rough guide to where the take-off point should be is approximately 90cm along the bar from the approach side upright, and about 60cm away from the cross bar. This seems to work well for athletes jumping in the 1.60m to 1.70m range. Athletes who have PB's lower than this may take off a little further along and closer to the crossbar. Athletes with PB's greater than 1.70m might need to take off farther away from both the centre of the bar and from the crossbar.

In the photo at right can be seen a piece of purple tape which is at 90cm along and 60cm out. The yellow tape is a guide for a 1.85m jumper on that day, and the athlete shown has a PB over 2 metres. You can see he takes off still farther away.



The photo sequence below is of a young female jumper with a PB of about 1.50m.

The yellow tape on the ground is positioned at 90cm – 60cm.

The athlete takes off closer to the crossbar and further along the crossbar than the tape, but as can be seen she still clears the bar right at the centre of the cross bar, and lands safely well away from the end of the mat.

