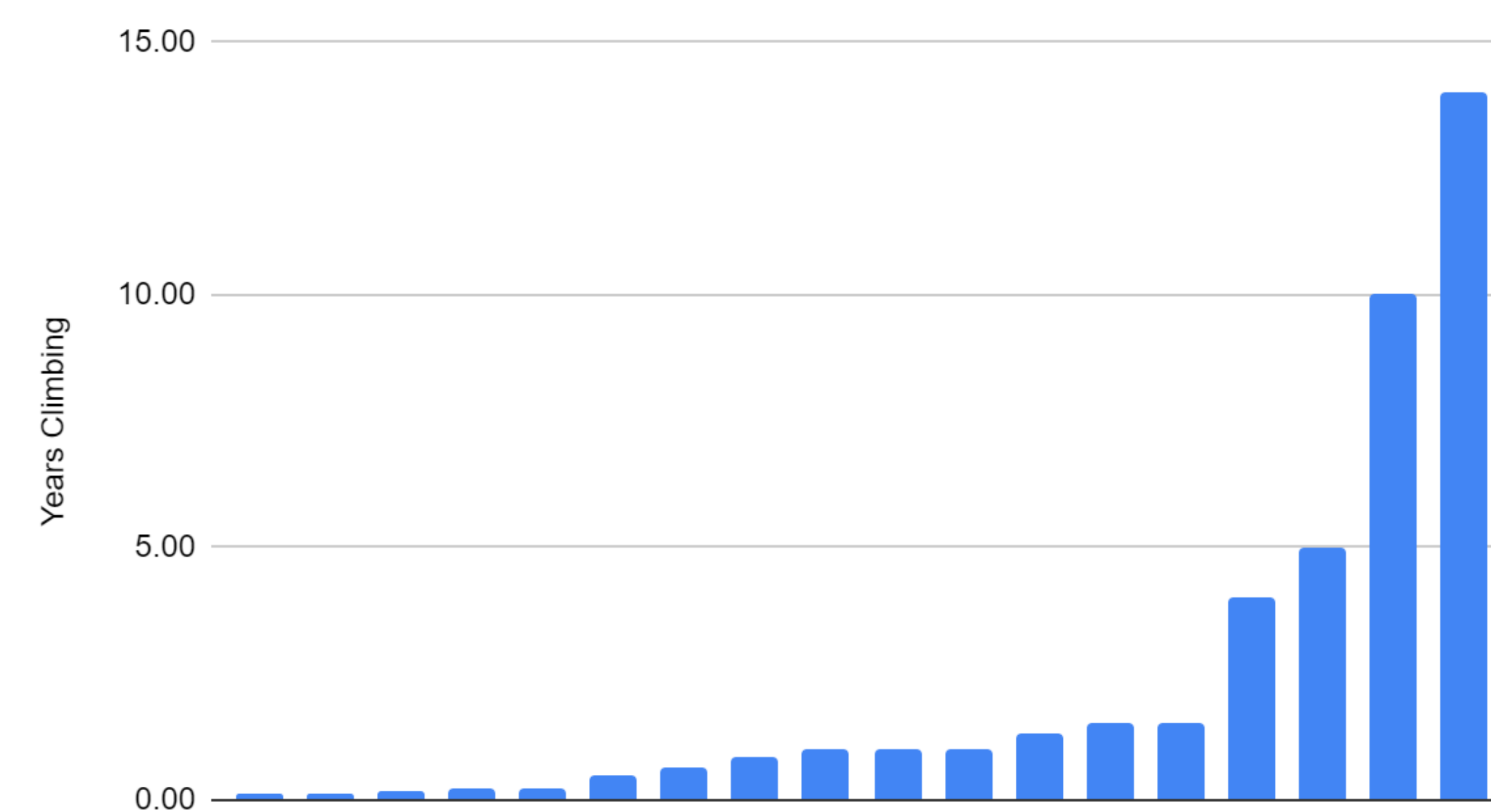


# Biomechanics of The Drop Knee

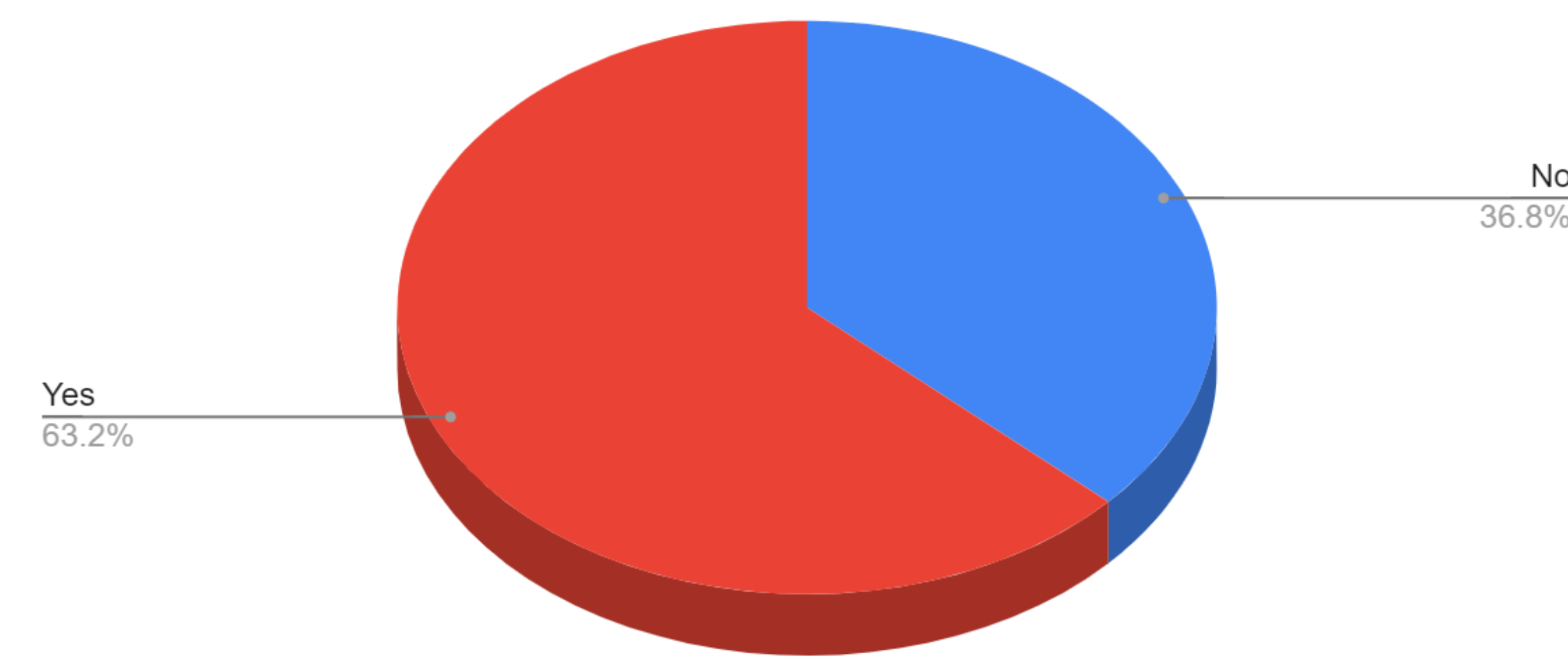
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## The risks, rewards, and how new climbers can benefit.

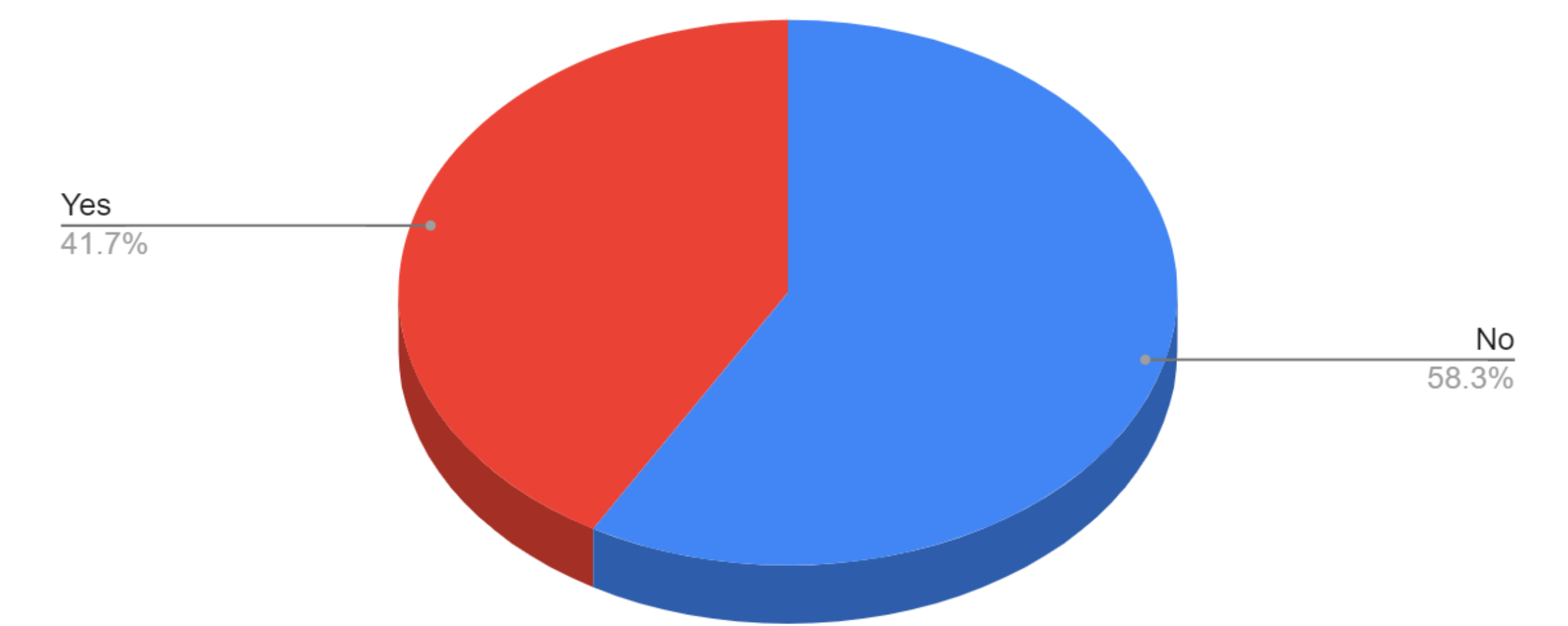
Years Climbing n=19



Heard of Drop Knee



Heard of Drop Knee Climbing One Year or Less n=12



Set up to drop knee. Similar to set up without using drop knee.

Drop knee in progress.

Stress on the knee.

Set up without using drop knee.

Movement without drop knee.

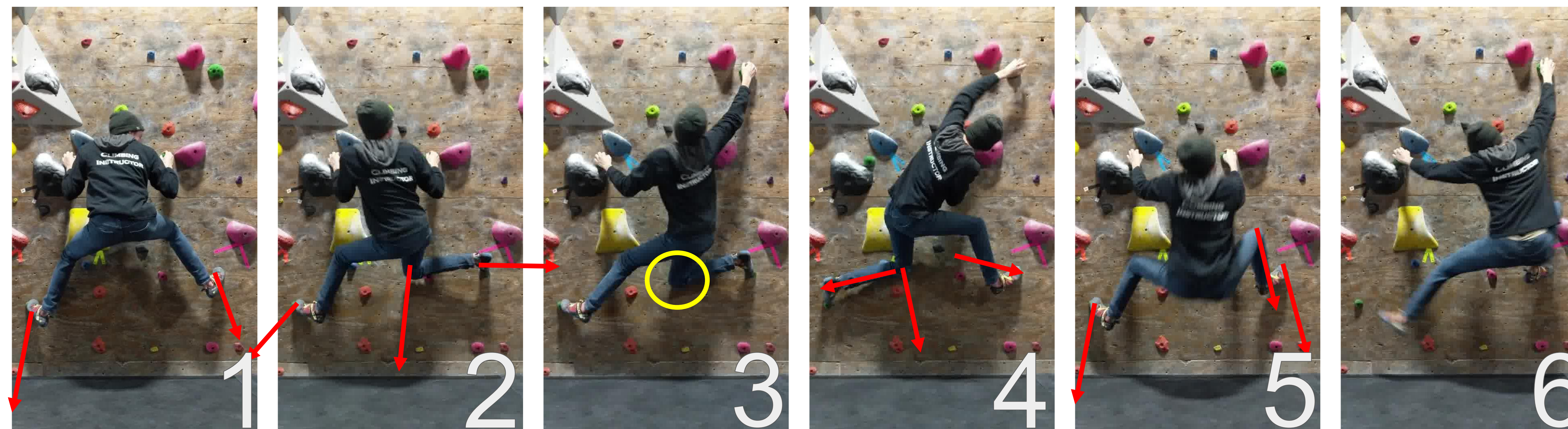
Right foot without drop knee being used.

Right foot with drop knee being used.

Stress on the knee

A novice climber, one who has been climbing less than one year, would have the line of force through their knee, through their toes, and towards the ground (images E, 5). This causes imbalance when moving to either the right or the left. When reaching for a hold all of the weight is placed onto one foot with the other foot in a pushing off motion. This causes the push off foot to lift off from the foothold and the leg to swing creating a 'barn door' movement (image 6). This can be a very hard swing that's difficult to recover from and will generally lead to a fall.

Using a different line of force with the hip internally rotated, abducted, and flexed, with the knee flexed, and the foot internally rotated; (images B, 2, 4) The 'drop knee' technique can put the climber in a position to be more successful and more controlled. Instead of using a dynamic movement, the 'drop knee' results in a slower and more static movement. This results in saving energy and a higher chance of success.



Set up to drop knee. Similar to set up without using drop knee.

Drop knee in progress.

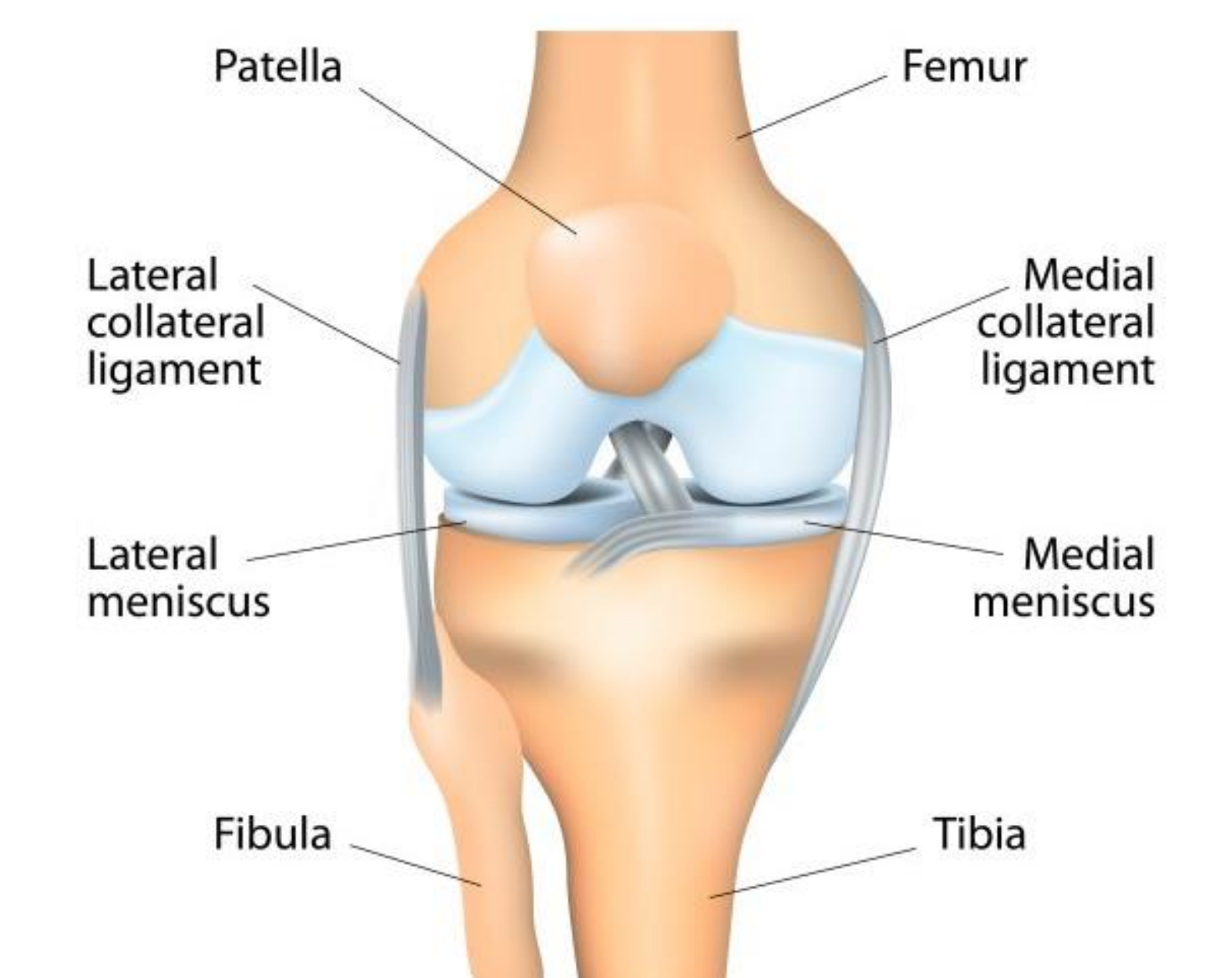
Stress on the knee.

Drop knee in progress.

Set up without using drop knee.

Movement without drop knee. Resulting in 'barn door'.

The 'drop knee' puts tremendous stress on the medial (inner) aspect of the knee. It is rare, but possible when at the extreme of this motion to cause damage to the medial collateral ligament of the knee as well as the medial meniscus (image H). Caution must be used when pain or strain is felt. It's often when newer climbers are trying too hard that injuries occur. Proper instruction on safety and listening to one's body is necessary to have a long climbing career.



Right Knee Anterior View

### How can we increase awareness and translate this into success for new climbers?

- Technique classes at local gyms
- Video series (Dave MacLeod Masterclass)
- Mentorships from experienced climbers
  - Reach out to younger climbers
- As a setter, force more technical movement
  - Gyms are moving to more dynamic/gymnastic style (olympic setting)
  - Climbing outdoors is far more technical than current gym setting
- Climb, climb, climb
  - Experience and body awareness is the best method of learning

