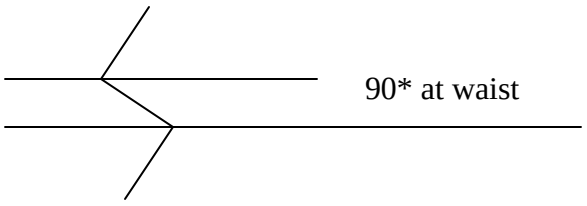
Skating Mechanics Analysis

Key Analysis Points

1. Body Position
2. Flex
3. Extension
4. Return

1. Body Position

   Look for 90* angles at hips and knees



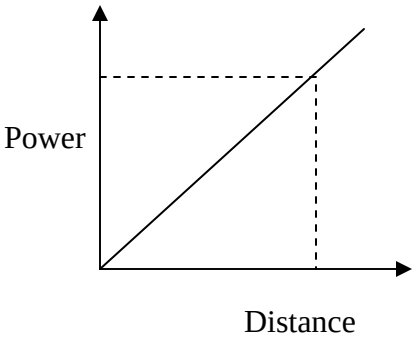
2. Flex (Full)

   - Power is generated from the flex of the legs.
   - Scientifically proven that 90* is the optinal angle of flex to provide maximum load in the quads and glutes.
   - Less then 90* does not provide maximum power load
   - More the 90* causes loss of power load in the key muscles.

3. Extension (Full)

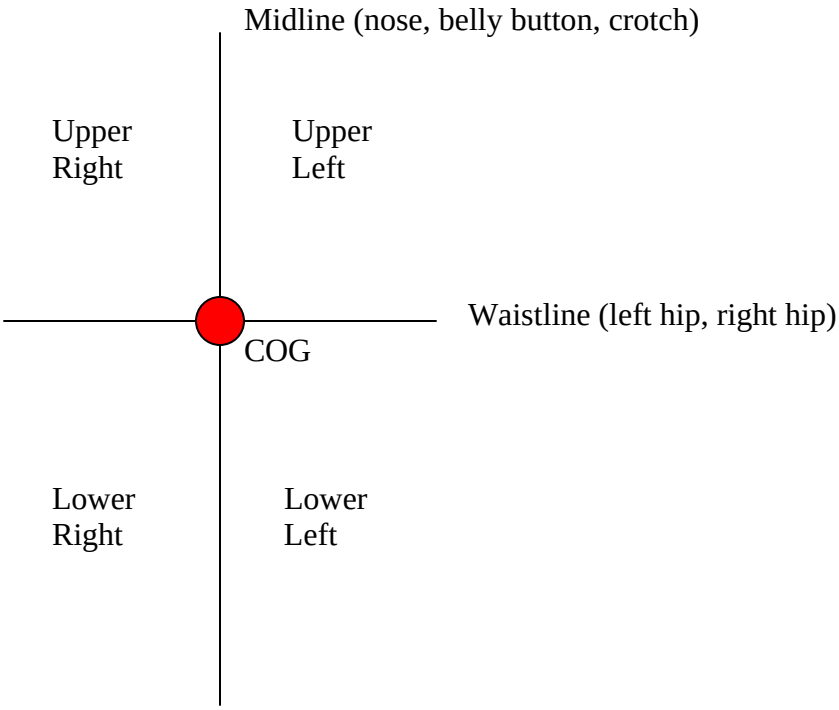
   - To transfer the power loaded in the quads and glutes at the full flex position to the ice the leg must extend.
   - It is the extension of the leg that expends the power energy and transfers it into motion.
   - To maximize this transfer the leg must extend fully.
   - A full extension also allows that transfer to exist for a longer period of time.
   - Full extension is when the angle between hip-knee-ankle is 180*.

- Extension must also occur at a 45* angle from the skating line
- 45* is the optimum angle that maximizes power over the greatest distance

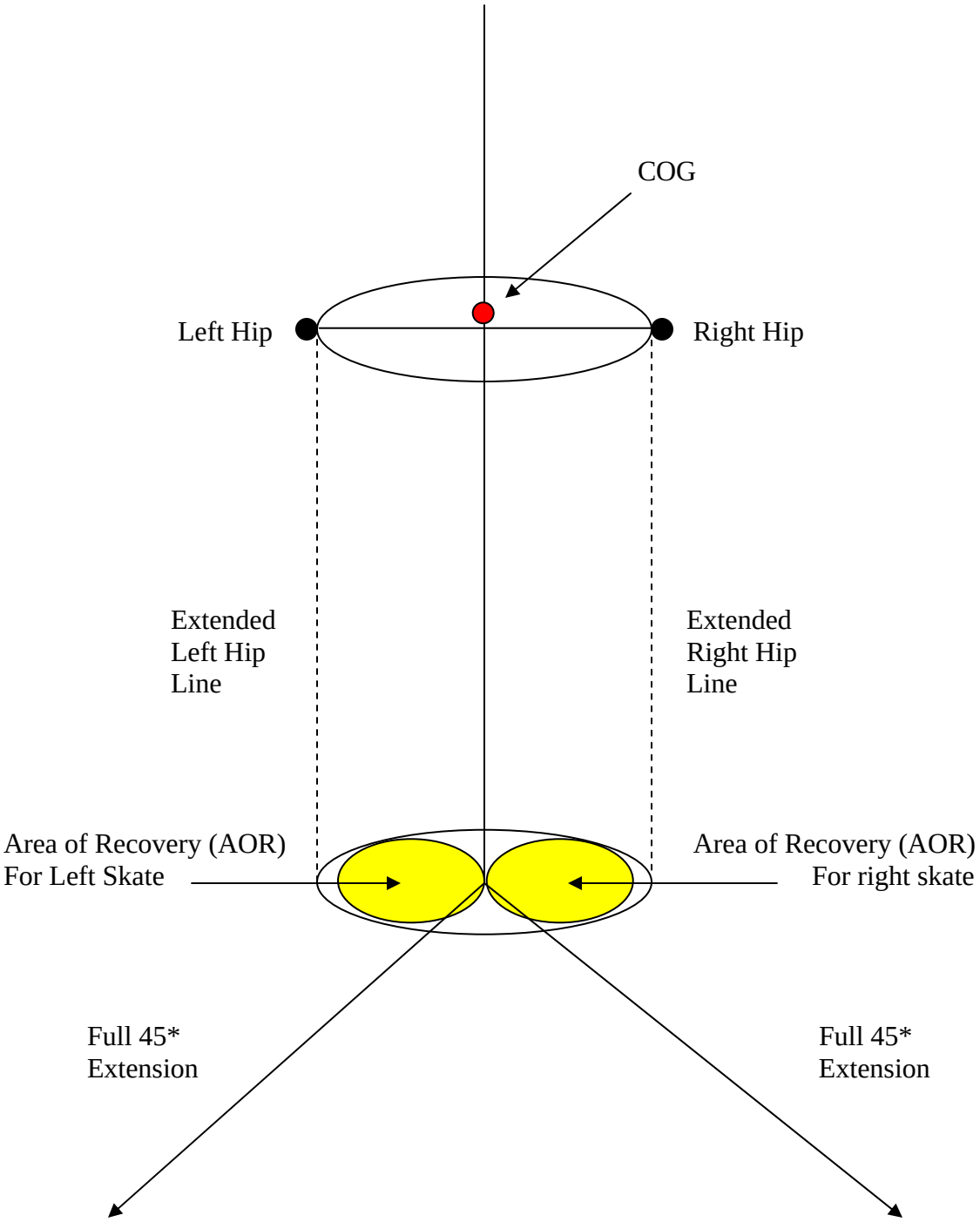


4. Return (Full)

- The return of the skate must be under the COG (center of gravity)
- The COG is represented by the belly button on a skater



- When skating power and work is done in the lower quadrants not the upper
- The upper quadrants are very quite – think “Keep the picture frame still”



Area of recovery – this is the area that the skate must return to. The goal is to have the skate return to as close to the midline as possible but not past it. Nor outside the hip line.

Technique

1. Lower body does the work (quads, glutes, hams, hip flexors, etc)
2. Upper body quite

The techniques pertaining to the lower body are all detailed above.

When talking about upper body we are talking about:

1. The picture frame – area framed by left and right shoulders and left and right hips (ie the torso)
2. The arms – the arms move but do not do the work of skating.

<u>Assessing "The Picture Frame"</u>

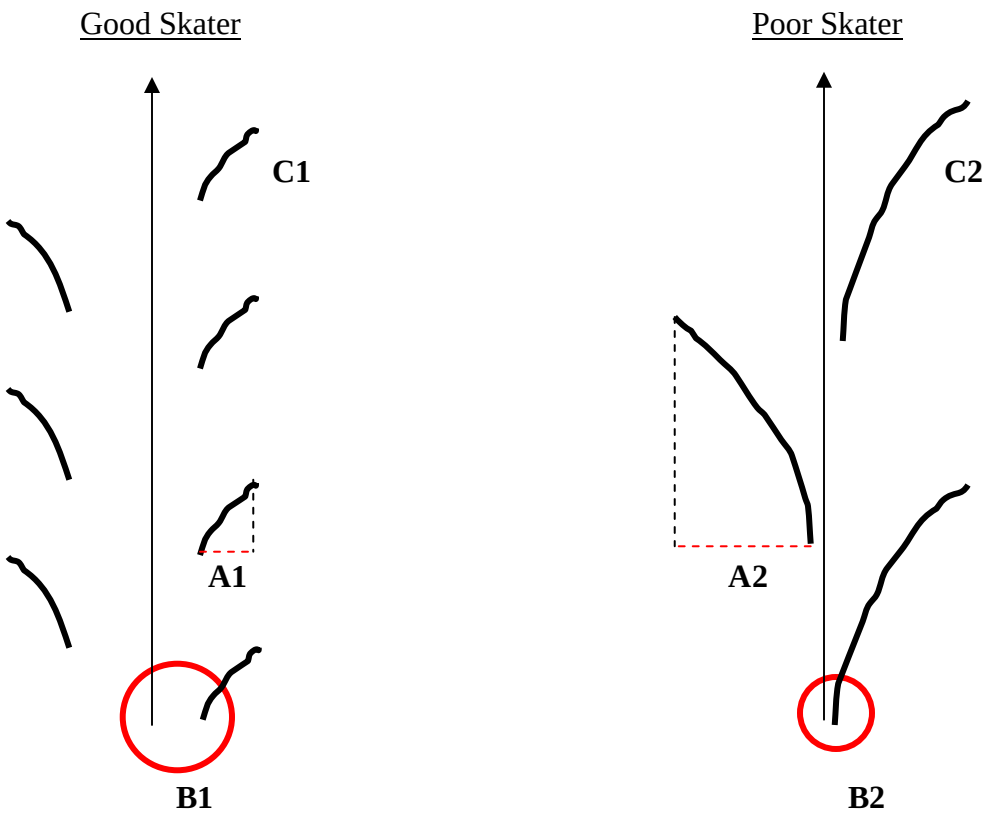
1. Body moving up and down
   Skater is not maintaining 90* flex at knees and/or waist.

2. Body moving side to side
   Skater is not making full return of skates after extension.
   Instead of returning skates to area of recovery they are laying them back on the ice outside this area (ie outside the hip lines).
   The COG has to adjust to get over the skate so the body has to move.

3. Body twists
   Skater is moving arms across midline of body.
   Arms are meant to move in parallel with the body. There can be slight movement across the body but not to the point of crossing the midline.

<u>Analyzing Skate Patterns</u>

- Much can be told by analyzing the skate blade marks left on the ice from a skater.
- Looking at length, gaps and various distances can tell if the sater has full flex, extension and return



A. This distance indicates if the skater's extension is maximized or not based on flex.
    1. Shorter length = Incomplete flex, hence powerless extension
    2. Greater length = Full flex, powerful full extension.

B. This distance indicates if the return is complete.
    1. Farther from midline = incomplete return
    2. Closer to the midline = more complete return

C. Length of skate mark
    A longer stride mark indicates that the skate is on the ice longer. A skate that is on the ice longer is a skate that is pushing longer.
    1. Shorter stride mark = incomplete extension
    2. Longer stride mark = full extension

Key Skating Muscles

For Balance – the stabilizer muscles are employed (The Core)

- Abdominals
- Obliques (internal & External)
- Hip Flexors
- Spinal Erectors
- Latisimus Dorsi

For Power – large muscles of the lower body

- Glutimus Maximus
- Quadraceps
- Hamstrings
- Gastrocnemius (calves)