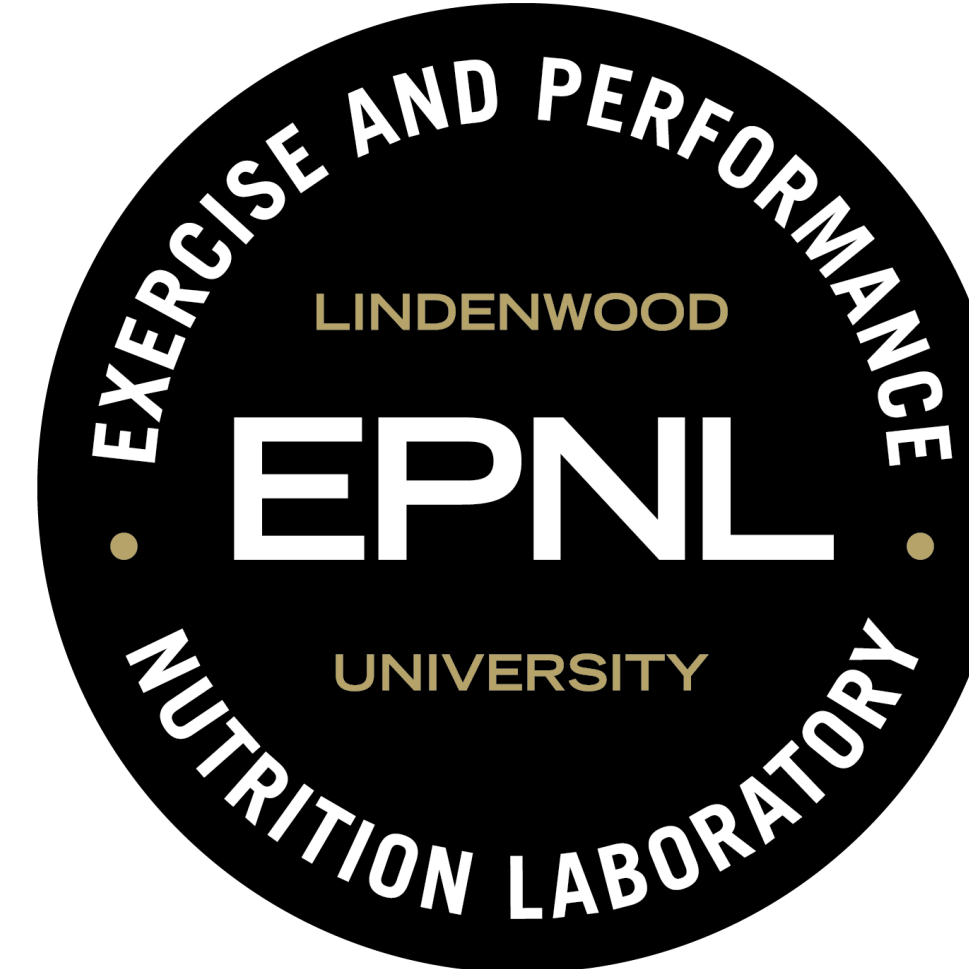


# Interlimb Asymmetries Differ Between Bilateral and Unilateral Countermovement Jump



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## Introduction

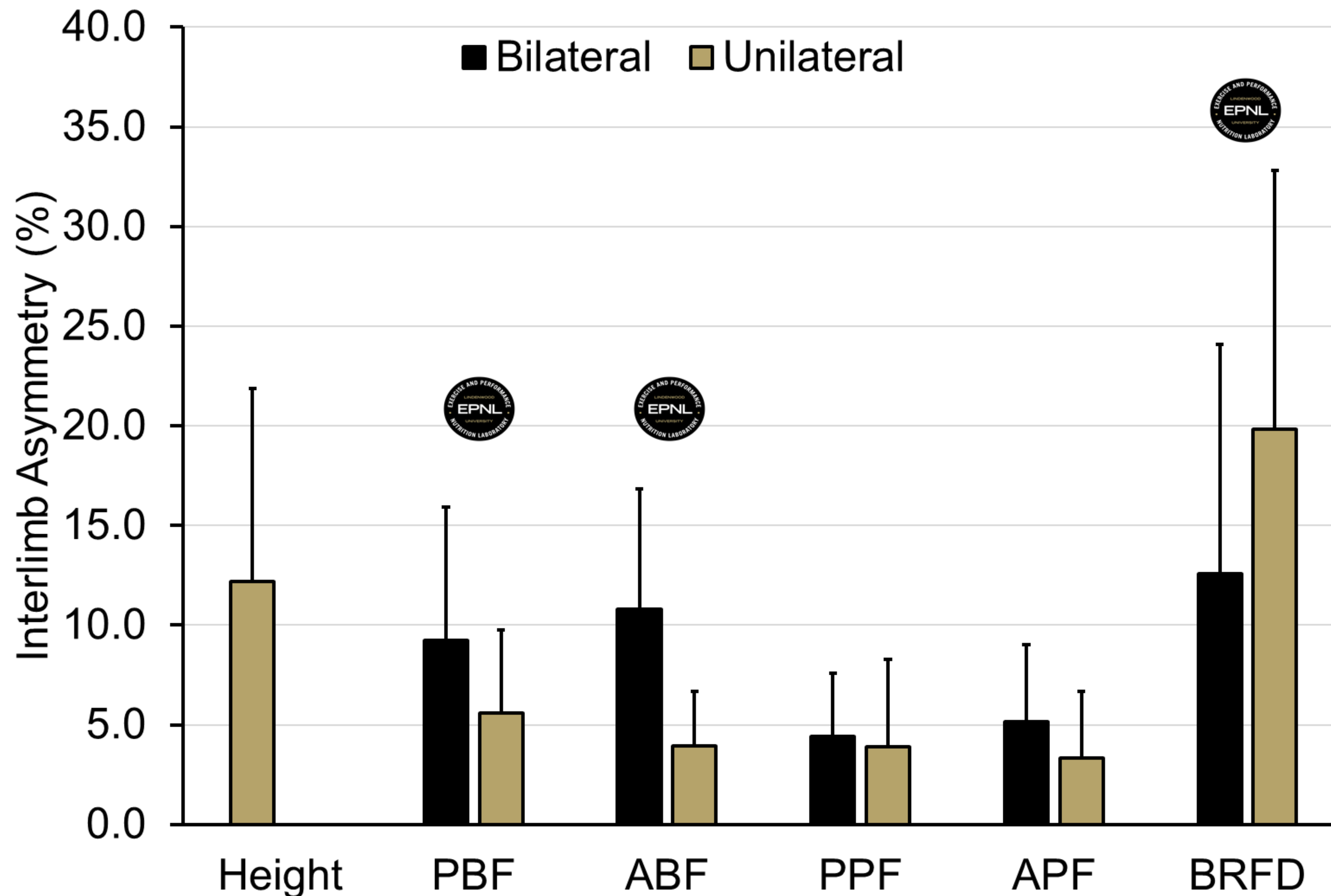
- Interlimb asymmetry is a comparison of one limb to the other and has been of great interest in athletic populations.
- Asymmetries of >15% have been related to an increased injury risk whereas an asymmetry of <10% is commonly used for athletes returning to sport following an injury.
- The countermovement jump (CMJ) has been shown to be a valid and reliable measure of interlimb asymmetry.
- Asymmetries measured during bilateral and unilateral CMJ have been shown to be unrelated and it has been suggested that the unilateral CMJ better represents limb capacity.
- Previous literature has reported interlimb asymmetries during a unilateral CMJ in male team-sport athletes.
- Female collegiate lacrosse demands a variety of movements and velocities which may increase lower limb injury risk.
- Therefore, it is important to understand the neuromuscular risk factors of these athletes.

## Purpose

- To compare the magnitude of interlimb asymmetries of female collegiate lacrosse athletes when performing a bilateral and unilateral CMJ.

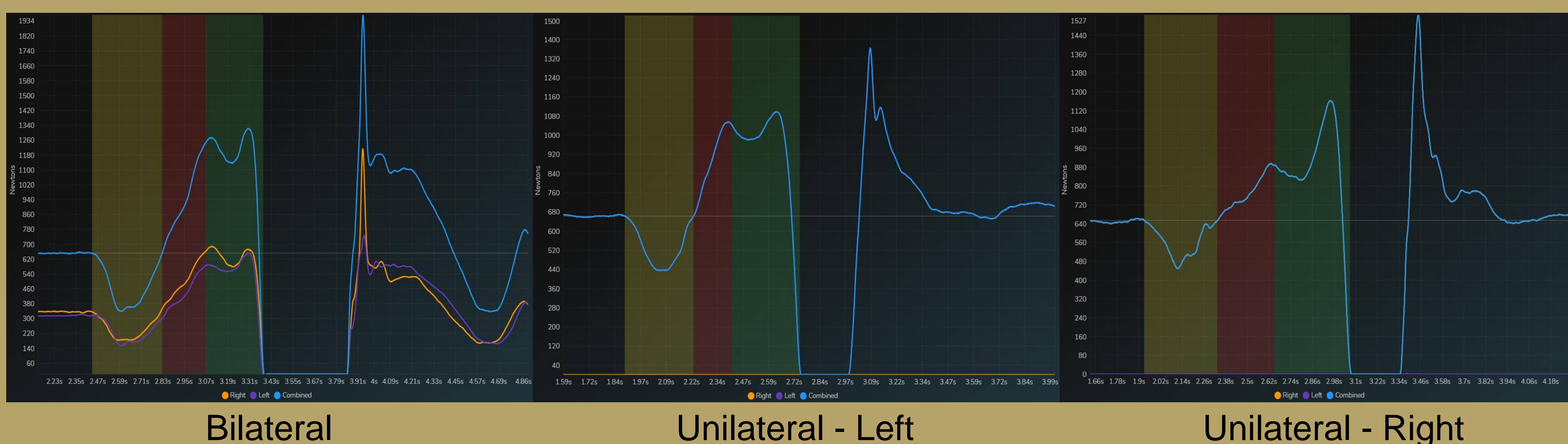
## Methods

- Twenty-three female collegiate lacrosse athletes (20±1 years, 168.2±5.6 cm, 65.7±6.5 kg) volunteered for this study.
- Athletes performed three bilateral CMJ and three unilateral CMJ using each leg.
- Jump height, peak and average breaking force, peak and average propulsive force, and breaking rate of force development from the two jumps with highest height was averaged.
- Interlimb asymmetries were calculated as percent interlimb difference:  $(100/(\text{maximum value}) * (\text{minimum value}) - 1 + 100)$ .
- Paired Student's t-tests were conducted between interlimb asymmetries measured from the bilateral CMJ and unilateral CMJ for each variable.



Logos signify significant differences between interlimb asymmetry measures using bilateral vs unilateral tests

## Measures of asymmetry using breaking force metrics vary between unilateral and bilateral tests



## Results

- Unilateral CMJ height revealed an average  $12.2 \pm 9.7\%$  interlimb difference.
- Unilateral jump height was  $41.3 \pm 5.8\%$  and  $41.9 \pm 7.4\%$  bilateral jump height on the left and right leg, respectively.
- Asymmetries were significantly different between bilateral and unilateral CMJ when measuring:
  - Peak breaking force ( $9.2 \pm 6.7\%$  vs  $5.6 \pm 4.2\%$ )
  - Average breaking force ( $10.8 \pm 6.0\%$  vs  $4.0 \pm 2.7\%$ )
  - Breaking rate of force development ( $12.6 \pm 11.5\%$  vs  $19.8 \pm 13.0\%$ )
- No significant differences were seen between CMJ styles for peak and average propulsive force.

## Conclusions

- Average interlimb asymmetry, as measured by all metrics except the unilaterally measured breaking rate of force development, was within the 15% threshold typically attributed to increased risk of injury.
- Female collegiate lacrosse athletes had lower interlimb asymmetries in peak and average breaking force while the asymmetry was greater in breaking rate of force development when performing a unilateral CMJ compared to a bilateral CMJ.
- Female collegiate lacrosse demands various unilateral change of direction and jumping tasks which may provide rationale for the lower unilateral asymmetries shown in our data.
- Our data support the previously reported notion that interlimb asymmetries may be task-dependent.
- Therefore, It is important for practitioners to determine the appropriate tests based on the athlete/sport needs prior to assessing interlimb asymmetries.

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