

# DIFFERENCES IN LOWER-BODY STRENGTH AND LEG LEAN MASS IN PRE, PERI AND POST-MENOPAUSAL WOMEN

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## INTRODUCTION

Women may spend up to **half of their lives in menopause**. The menopause transition is characterized by a decrease in estrogen levels, and concomitant increase in chronic disease risk. Menopausal changes coupled with the age-related loss of skeletal muscle mass (sarcopenia), can impact functionality and quality of life. It is important to understand the extent to which the menopause transition impacts measures of lower body strength and functionality.

## PURPOSE

To investigate the cross-sectional changes in **peak torque (PT)** and **total leg lean mass (LM<sub>total</sub>)** across the menopause transition.

## FORMULAS

$$\text{Adjusted PT} = \frac{\text{Peak Torque}}{\text{Dominant leg LM}}$$

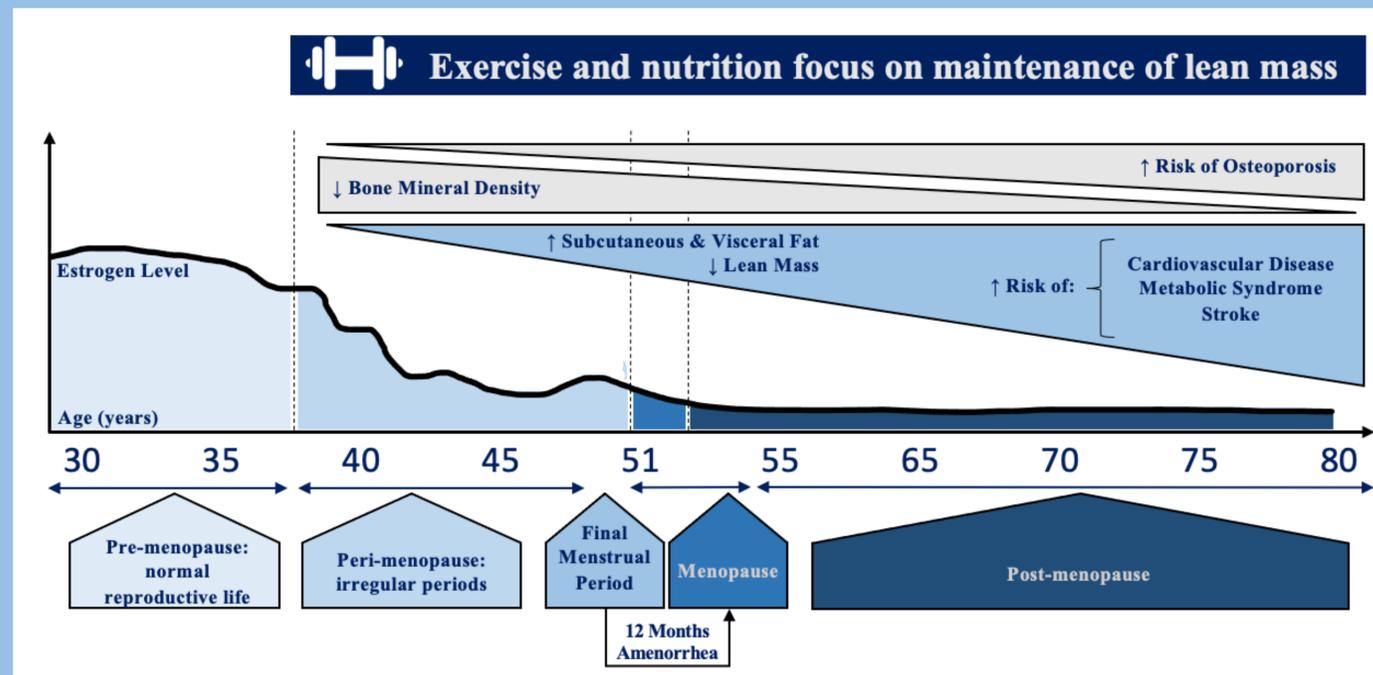
## RESULTS

VARIABLE	PRE	PERI	POST
PT (Nm)	359.82 ± 121.97	300.58 ± 68.23	323.54 ± 74.64
ADJUSTED PT (Nm)	20.53 ± 5.65	19.30 ± 3.79	20.83 ± 4.83
LEG LM (kg)	34.22 ± 4.88 *	31.23 ± 4.92	31.13 ± 4.87*

Table 1. One-way ANCOVA, covaried for age results for PT, adjusted PT, and LM<sub>leg</sub>. Data displayed as mean ± standard deviation. \* indicates significant difference between groups (p<0.05)

For prescribing exercise and nutritional strategies to women in the menopause transition, maintenance of LM should be a primary focus; an average of 1.5 kg lost in the legs may have significant implications for functionality and quality of life.

## PRACTICAL APPLICATIONS



**Pre-menopausal (PRE)** women were ≥35 years old and eumenorrheic for the previous 12 months

**Peri-menopausal (PERI)** women were ≥38 years old and experiencing irregular menstrual cycles

**Post-menopausal (POST)** women were amenorrheic for ≥12 consecutive months

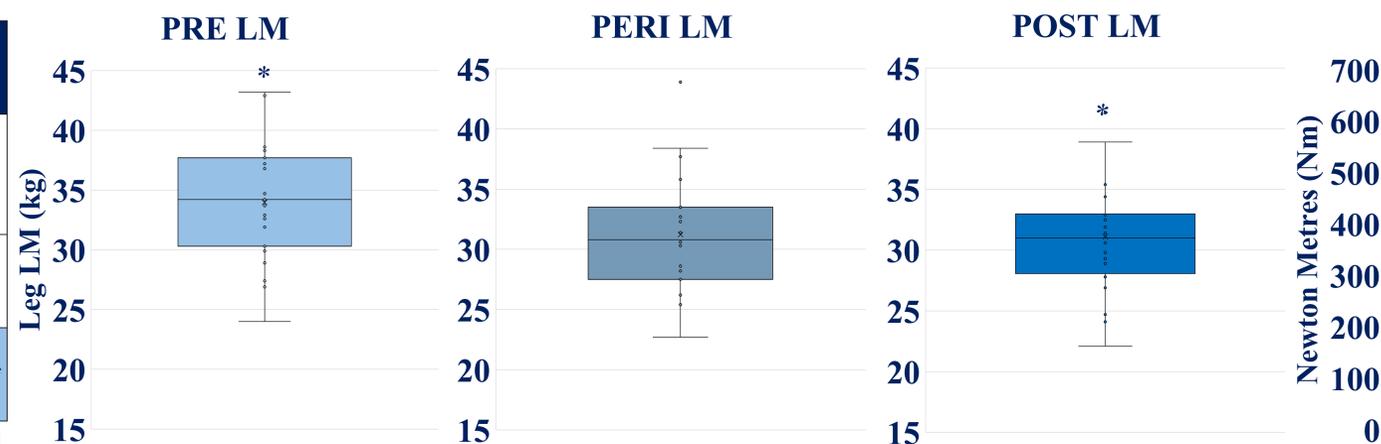


Figure 1. Box and Whisker plots for leg lean mass. \* indicates significant difference between pre and post groups (p<0.05)

## METHODS

### PARTICIPANTS:

72 healthy females (24 PRE, 24 PERI, 24 POST)  
 (Mean ± Standard Deviation: Age=48.1 ± 7.1 yrs,  
 Ht=163.0 ± 6.4 cm, Wt= 69.2 ± 14.5 kg, BMI  
 26.01 ± 5.21 kg/m<sup>2</sup>)



Knee extensor strength was evaluated via isometric dynamometry. Participants completed three maximal contractions with one minute rest in between.

Whole-body dual-energy x-ray absorptiometry (DXA) scans were performed to evaluate LM<sub>total</sub> and leg-specific LM (LM<sub>leg</sub>)



## CONCLUSION

The lack of significant differences in PT between menopause groups suggests that despite a 1.5 kg decrease in lower body LM, **the menopause transition alone is not a main contributing factor to potential declines in lower body strength with age.**

## ACKNOWLEDGMENTS

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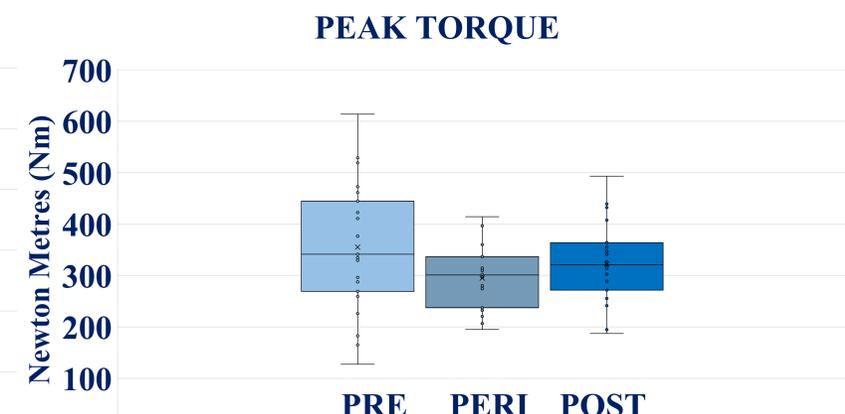


Figure 2. Box and Whisker plots for peak torque. Comparisons were not statistically significant (p>0.05)