

# Sonographic Features of the Abdominal Wall Perimuscular Connective Tissues in People with and without Lumbopelvic Pain

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**BACKGROUND:** The abdominal wall muscles are important for spinal control and under normal circumstances function in a coordinated manner to pressurize the abdominal cavity and transfer loads around the trunk through the perimuscular connective tissue (PMCT).<sup>1</sup> There is evidence of functional deficits of these muscles in individuals with LPP<sup>2</sup> however little is known about the PMCT in this population. Ultrasound imaging (USI) provides a non-invasive method to quantify PMCT thickness and may be able to shed light on the differences in the resting characteristics of these tissues in the abdominal wall of persons with LPP.<sup>3</sup>

**METHODS:** Brightness-mode USI was used to measure the resting thickness of the PMCT (figure) associated with the four abdominal muscles in 50 participants (25 with and 25 without LPP, aged 36.3±9.4 and 46.6±8.0 years respectively).

**RESULTS:** Cohorts did not differ in gender, body mass index (BMI) or parity. However, the LPP group was slightly older ( $p=0.01$ ). Total PMCT thickness did not correlate with age or gender however did with BMI. The LPP cohort had significantly thicker PMCT ( $0.55 \pm 0.02\text{cm}$ ) than the control group ( $0.43 \pm 0.02\text{cm}$ ; ANCOVA adjusted for BMI,  $p=0.007$ ).

**CONCLUSIONS:** This is the first investigation to consider the resting thickness of the PMCT associated with the abdominal muscles and the first to report differences in persons with LPP. These findings are not attributable to characteristics such as BMI, age or gender. Possible causes include remodelling driven by increased loading or altered movement patterns, chronic inflammation or genetic factors.

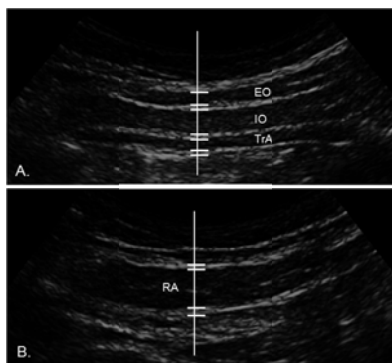


Figure: Thickness measurements of the PMCT associated with A. the external oblique (EO), internal oblique (IO), transverses abdominis (TrA) and B. the rectus abdominis (RA) muscles.

## REFERENCES

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