

## Effects of Exercise In Mice with Benign Prostatic Hyperplasia

Megan D. Pearce<sup>1</sup>, William A. Ricke<sup>2,3</sup>, Teresa T. Liu<sup>2,3</sup>

Department of Urology<sup>2</sup>, George M. O'Brien Center for Research Excellence<sup>3</sup>

**Introduction and Objective:** Benign prostatic hyperplasia (BPH) impacts the lives of 50% of men over the age of 50, and that number jumps to 70% once that man reaches the age of 60. There are a number of issues associated with BPH including lower urinary tract symptoms (LUTS). LUTS causes an increase in the urgency and frequency of urination in older men, due to an enlargement of the prostate, smooth muscle dysfunction, and/or fibrosis. It has already been shown that exercise decreases lower urinary tract dysfunction (LUTD) measured by void spot assays (VSA). However, it is unknown which aspects of disease (e.g., fibrosis, proliferation, contractility) are alleviated by exercise intervention. This study examines the effect of exercise on fibrosis. **We hypothesize that fibrosis is decreased in aged mice upon exercise intervention.**

**Methods:** Young (2-month-old) and aged (24-month-old) mice were given free access to running wheels for 4 weeks. LUTD was assessed weekly using VSA quantified by VoidWhizzard. Masson's trichrome, Verhoeff Van Geison, and picrosirius red (PSR) staining was performed on formalin-fixed paraffin-embedded (FFPE) sections. PSR was imaged using circular polarized light to capture birefringence. Collagen and elastin were quantified using ImageJ macros.

**Results:** Collagen deposition is decreased in aged mice upon four weeks of exercise intervention. Collagen is decreased in young mice upon four weeks of exercise intervention. In particular, the larger collagen bundles (e.g., red and orange by PSR) were shown to decrease with exercise. Additionally, there was an increase in elastin upon exercise.

**Conclusions:** Exercise intervention improves LUTD in aged mice. This occurs concurrently with a decrease in collagen and an increase in elastin within the prostate lobes. This suggests that there is potential for doctors to prescribe exercise as an intervention for reducing the LUTS associated with BPH.

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