

## Female Urology (II)

### Moderated Poster

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### EFFECT OF CYCLICAL ESTROGEN ON BLADDER WEIGHT AND STRUCTURE

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Introduction and Objective: Estrogen is essential for physiological maintenance of female urogenital tract. Pre- and post-menopausal women are subject to lower urinary tract dysfunctions, such as incontinence, interstitial cystitis, recurrent bladder infection, and bladder overactivity. We believed that cyclical alterations in estrogen play a major role in mediating these dysfunctions. Methods: 20 female NZW female rabbits were separated into 5 groups of 4 each. Group 1 served as control, rabbits of group 2 to 5 were ovariectomized, group 2 (Ovx) received no estradiol (2 weeks), group 3 to 5 were given 17- $\beta$  estradiol (1 mg/kg/day) by subcutaneous slow release tablet implant beginning two weeks after Ovx and lasting for 2 weeks (group 3: Ovx + E). Groups 4 and 5 had their tablet removed and group 4 was evaluated 2 weeks later (Ovx + E - E). At this time, group 5 were estrogenized for an additional two weeks by implanting a new tablet (Ovx + E - E + E). For each rabbit, bladder weight was recorded and full thickness histological sections were taken for smooth muscle (SM) and collagen evaluation by immunohistochemistry and quantitative digital image analyses and presented as the volume fraction (%) of either SM or Collagen. Results:

	control	Ovx	Ovx + E	Ovx + E - E	Ovx + E - E + E
Bladder Weight (g)	2.3 +/- .4	2.35 +/- .3	6.2 +/- 1 * x	3.5 +/- .6	5.5 +/- .8 * x
Volume Fraction SM	50.5 +/- 2.3	35.8 +/- 5	53.7 +/- 2.6 x	19.6 +/- 5 *	52.6 +/- 7 x
Volume Fraction Collagen	15.5 +/- .8	30 +/- 1.6	15.1 +/- 2 x	19.8 +/- 2.5	11.4 +/- 4 x

\* = significantly different from control; x = significantly different from Ovx,  $p < 0.05$   
Ovx resulted in a significant atrophy of the smooth muscle and expansion of the connective tissue compartment whereas estrogen stimulated a substantial SM hypertrophy and a reduction of the collagen component. Removing the estrogen produced a rapid SM atrophy and regression. Re-estrogenizing resulted in a significant increase in the SM compartment and regression of the collagen component. It should be remembered that the mucosa was included in the calculations and thus the sum of the SM + collagen will be less than 100%. Conclusions: These studies demonstrate the pronounced effect that estrogen cycling has on both bladder weight and structure. We believe that these

marked cyclical alterations correlate with blood flow and functional changes and in sensitive women can result in symptomatic changes.

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