

## URETHRAL FUNCTION MEASUREMENTS; DIFFERENCES AMONG SEVERAL URINARY INCONTINENCE SUBTYPES

### Hypothesis / aims of study

Given emerging data regarding the role of the urethra in patients with over active bladder, we hypothesized that urodynamic measures of the urethra would differ in incontinent women (regardless of type of incontinence) compared to continent women. Our objective was to describe the relationships between urodynamic measures of urethral sphincter function in continent and incontinent women.

### Study design, materials and methods

We recruited continent community-dwelling women and incontinent women with symptoms of stress urinary incontinence (SUI) or overactive bladder (OAB) presenting for urogynecologic care to undergo standardized urodynamic testing (UDS). UDS were performed using a 6 channel Laborie Dorado (Laborie Medical Technologies, Williston, VT) and microtip catheters with participants reclined at 45°. Urethral sphincter function was assessed using urethral profilometry. Two serial urethral pressure profile (UPP) measurements were done using an 8 French dual microtip catheter with the transducer oriented laterally facing 9 O'clock. The two measures were averaged. Urodynamic methods, definitions, and units conformed to the International Continence Society standards. All participants also completed demographic information as well as the Medical, Epidemiologic, and Social Aspects of Aging (MESA) and Pelvic Floor Distress Inventory (PFDI) questionnaires. One-way analysis of variance was used to compare means between independent groups.

### Results

86 women enrolled and underwent UDS. Based on the urodynamic findings women were classified into 1 of 4 groups: 30 continent women, 31 women with USI, 17 women with DOI, and 8 women with mixed urinary incontinence (MUI [USI + DOI]). Table 1 shows demographic, MESA, PFDI, and urethral function parameters for the 4 groups. Continent women were significantly younger than incontinent women regardless of incontinence subtype. Not surprisingly, MESA urge scores were higher in women with DOI, while MESA stress scores were higher in women with USI. In addition to having lower PFDI urinary subscale scores, continent women also had lower PFDI prolapse and colorectal subscale scores compared to incontinent women. Maximum urethral closure pressure and the area of the continence zone (area under the UPP) were 47% and 54% lower respectively in women with USI compared to continent women. Interestingly, women with DOI and MUI also had lower MUCP (39% lower) and area under the UPP (35% and 41% lower respectively) compared to continent women although the difference was not as prominent as women with USI (Figure 1).

### Interpretation of results

Urethral function is increasingly thought to play a role in OAB in addition to stress urinary SUI. Nearly half of women with SUI also report OAB symptoms, and a third of women with urodynamic stress incontinence (USI) have coexistent detrusor overactivity incontinence (DOI). Similarly, DOI improves after SUI surgery in some women. Investigators have found that urethral pressure increased during filling cystometry in women with USI, but not those with DOI, suggesting that impaired urethral function may be associated with OAB [1]. Our data supports this theory as MUCP and area under UPP were lower in women with each type of incontinence compared their continent counterparts.

Pelvic floor disorders are common often co-exist [2]. Incontinent women seeking urogynecologic care had higher PFDI subscales for prolapse and bowel symptoms indicating that they may have co-existent pelvic floor disorders.

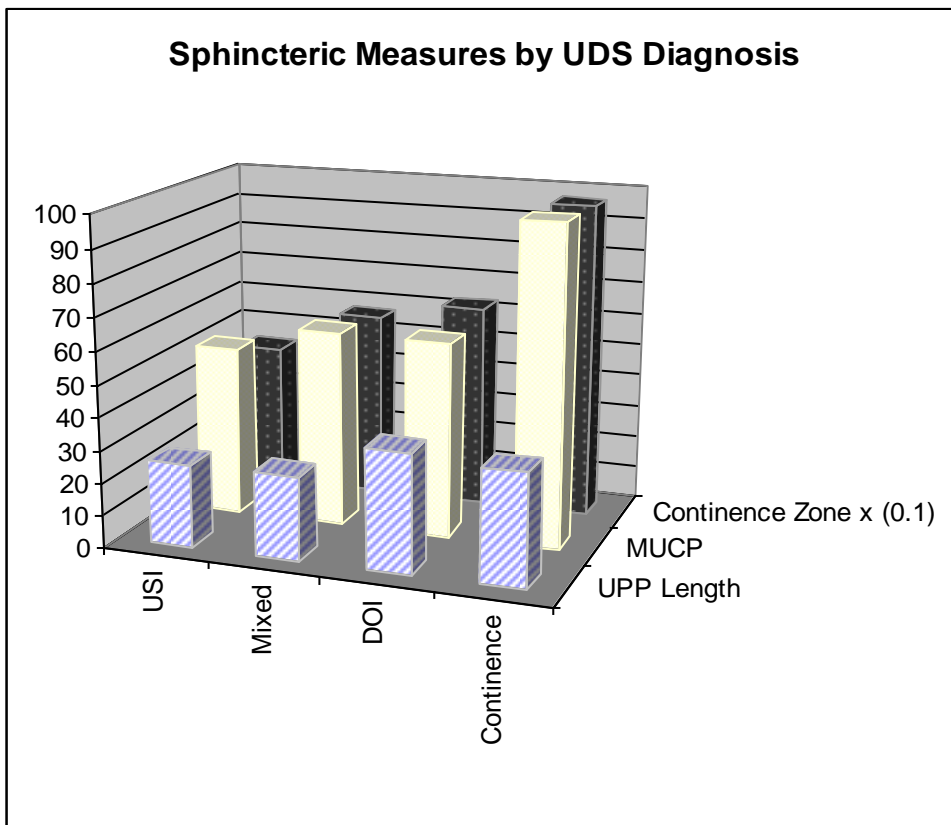
### Concluding message

Urethral sphincter function in women with DOI and MUI tends to be intermediate between those of continent and stress incontinent women. These data suggest that DOI in some women may be a failure of urethral sphincteric function. They also suggests that DOI and SUI may represent a continuum of urinary incontinence.

Table 1.

	<b>USI N=31 Mean (SD)</b>	<b>USI + DOI N=8 Mean (SD)</b>	<b>DOI N=17 Mean (SD)</b>	<b>Continent N=30 Mean (SD)</b>	<b>P Value</b>
<b>Age</b>	48 (9)	51 (12)	63 (14)	39 (15)	<.0005
<b>Body Mass Index</b>	28 (7)	32 (10.4)	35 (8.3)	296 (8.8)	.05
<b>UDI-6</b>	49.6 (21.4)	46.4 (13.1)	53.6 (22.6)	4.9 (10.2)	<0.0005
<b>POPDI</b>	19.1 (19.1)	36.9 (22.4)	22.4 (27.6)	0.83 (2.8)	<0.0005
<b>CRADI</b>	17.9 (16.3)	25.5 (19.0)	17.6 (14.2)	2.5 (5.3)	<0.0005
<b>MESA Urge Score</b>	39.9 (22.7)	45.6 (31.4)	61.5 (26)	4.4 (9.7)	<.0005
<b>MESA Stress Score</b>	73.3 (16.9)	54.1 (17)	45 (23.9)	8.3 (17.)	<.0005

Figure 1.



References

1. CHALIHA C, DIGESU GA, HUTCHINGS A, KHULLAR V. Changes in urethral function with bladder filling in the presence of urodynamic stress incontinence and detrusor overactivity. Am J Obstet Gynecol 2005;192:60-5.
2. Lawrence JM, Lukacz ES, Nager CW, Hsu JW, Luber KM. Prevalence and co-occurrence of pelvic floor disorders in community- dwelling women. Obstet Gynecol 2008; 111:678-85.

Disclosures

**Funding:** None **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** IRB Helsinki: Yes **Informed Consent:** Yes