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Exercise Dosage and Pelvic Floor Muscle Function in Young Women With and Without Urinary Incontinence

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Exercise Dosage and Pelvic Floor Muscle Function in Young Women With and Without Urinary Incontinence

EWU RESEARCH SYMPOSIUM 2014

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WHAT IS URINARY INCONTINENCE (UI)?

Any **involuntary** loss of urine... [Abrams et al., 2002]

Stress Incontinence v. Urge Incontinence

Who?

- Females > Males
- Populations who are obese, pregnant, or elderly
[Eliasson et al., 2004]
- Young, nulliparous, healthy females...

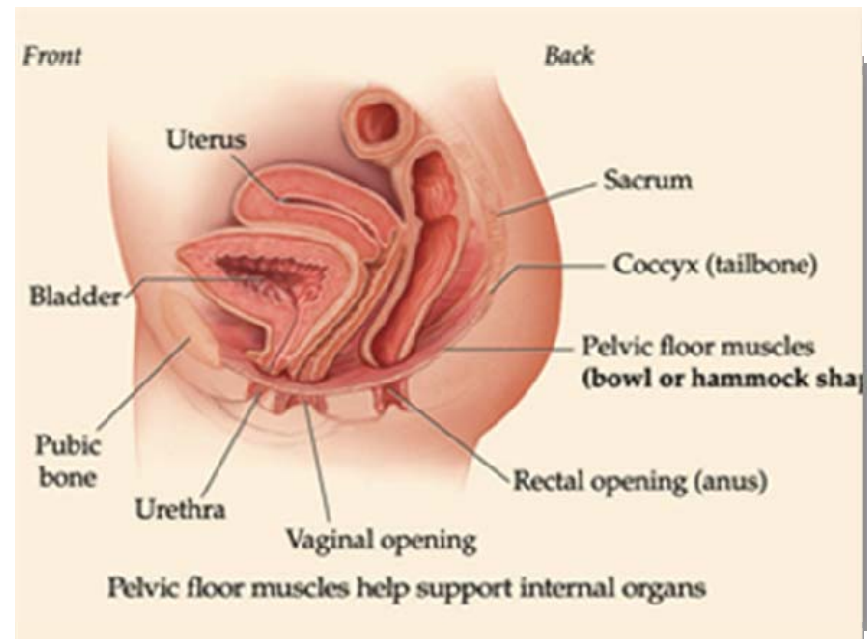
WHY YOUNG, HEALTHY FEMALES?

38%-50% report UI during
daily living & sport
activity...

[Eliasson et al., 2004; Bo & Borgen, 2001; Kruger
et al., 2007]

Why?

- High intra-abdominal pressure (IAP) during high impact activity
- Poor control of the pelvic floor muscles (PFM), transverse abdominus (TrA), and diaphragm [Sapsford, 2003; Madill & McLean, 2006]

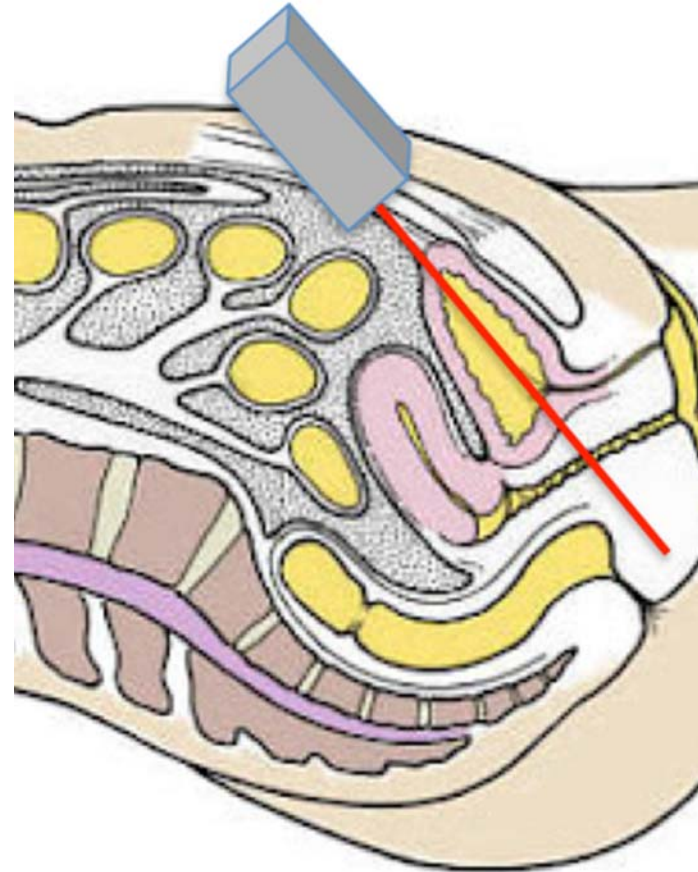


HOW CAN WE MEASURE PFM CONTROL?

Transabdominal
Real Time Ultrasound
Imaging (RTUS)

Visualization of bladder floor:

- Ascends with PFM contraction
- Descends with Valsalva maneuver



RTUS IMAGING

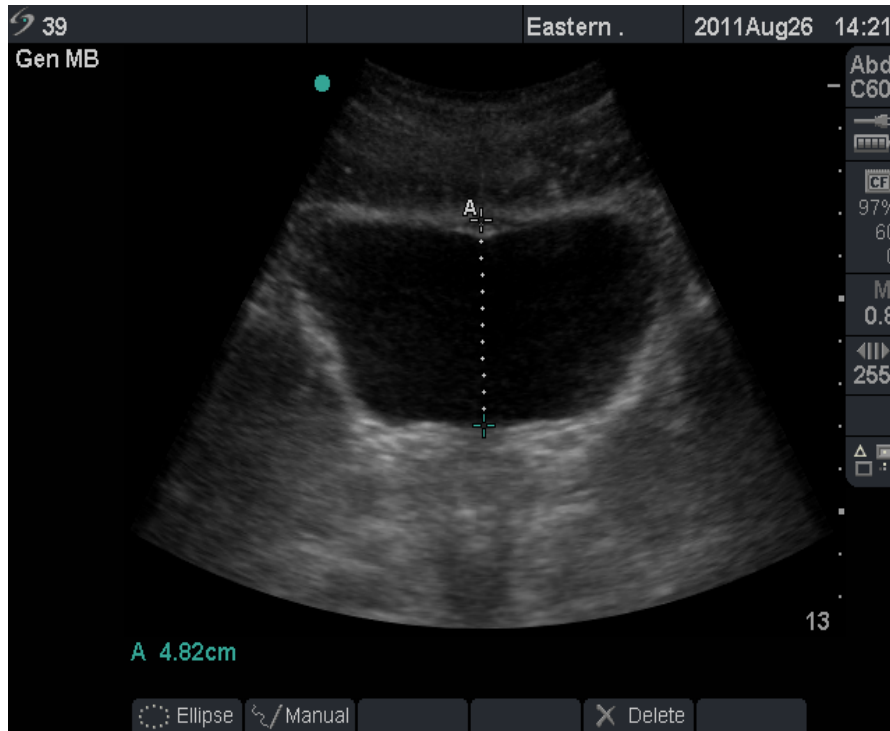


Figure 1. PFM Contraction

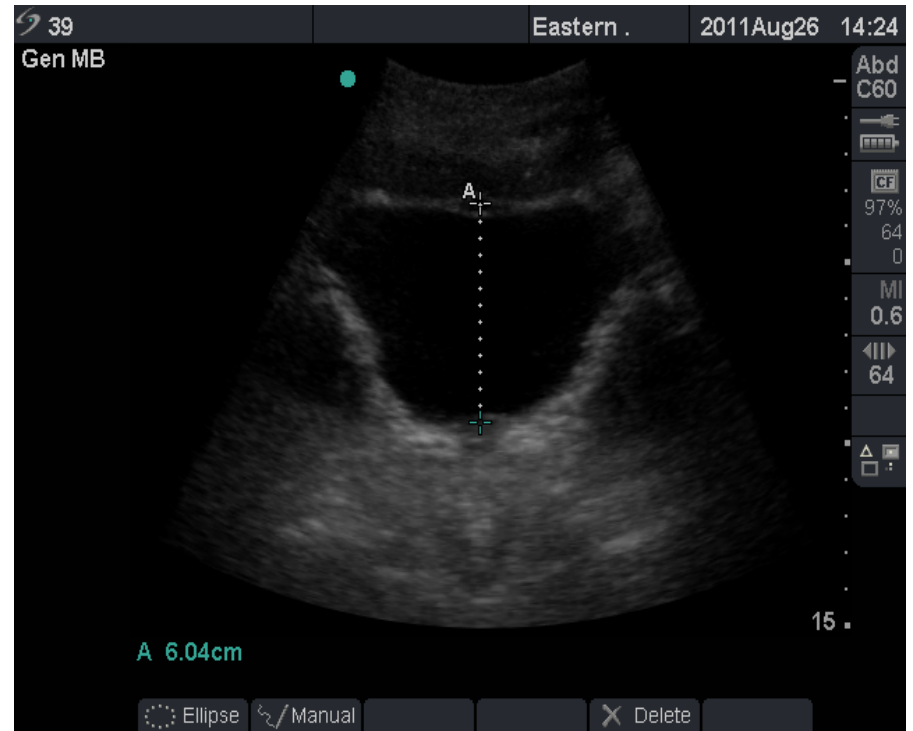


Figure 2. Valsalva Maneuver

WE WANTED TO
KNOW....

Can higher levels of physical activity lead to
poor pelvic floor muscle control in young,
nulliparous, healthy females?

AND WE LOOKED AT...

48 female volunteers from the EWU Riverpoint and Cheney campuses who:

- Were 18-30 years old
- Have never been pregnant
- Had no known congenital pelvic deformities

DATA COLLECTION

Bladder filling protocol

Completion of standardized questionnaires

- Incontinence Severity Index
- Urinary Status Questionnaire
- International Physical Activity Questionnaire

Clinical examination

- PFM & TrA coordination
- Pelvic Angle
- Chest Excursion

RTUS

- Resting
- PFM contraction
- Valsalva Maneuver



THE RESULTS

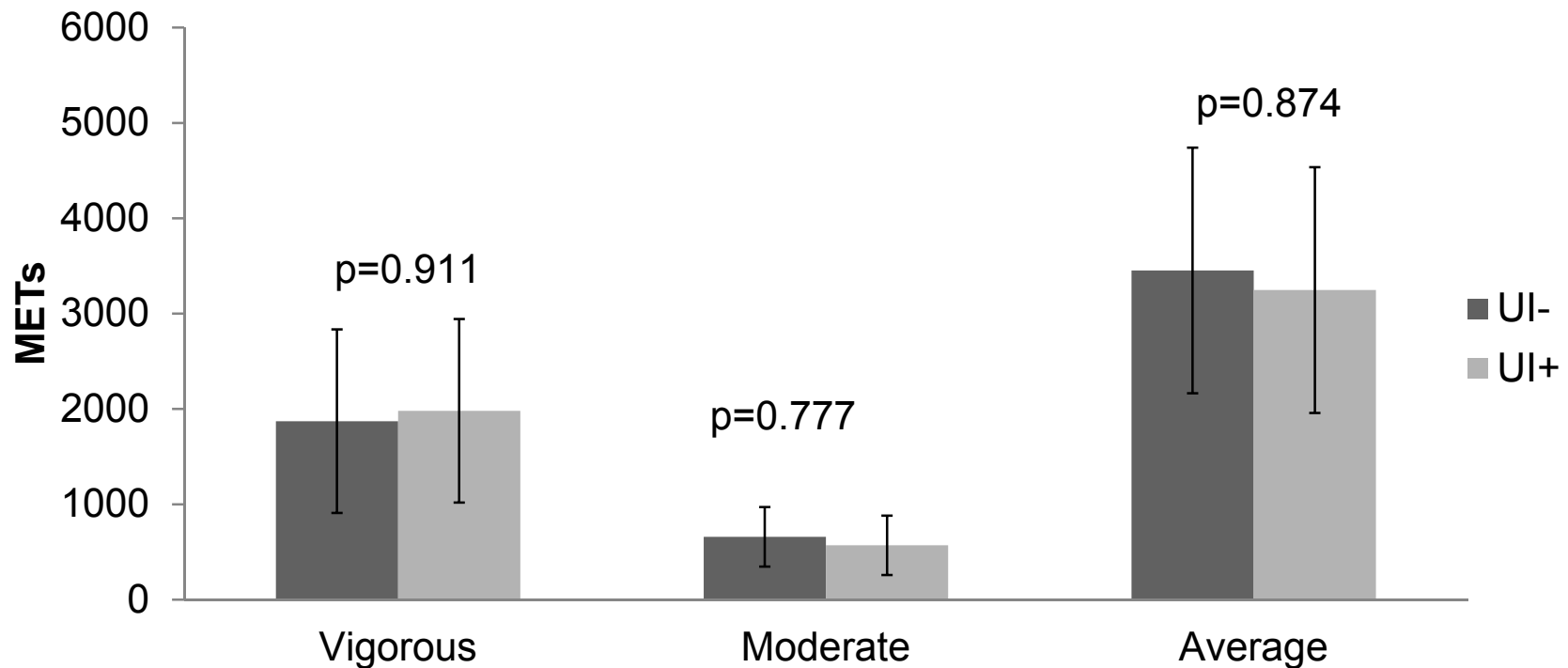
- 48 subjects met eligibility criteria
- 94% with college degree or some college
- **23%** (n=11) reported UI in the past 4 weeks
 - 8% (n=4) presented with moderate to severe UI (ISI Score ≥ 3)

Subject Demographics and Exam Findings			
	UI +	UI -	<i>t-test</i> p value
Age (Years)	21.3 \pm 2.6	22.8 \pm 3.1	.390
BMI (kg/m ²)	22.7 \pm 3.1	22.7 \pm 2.92	.980

Metabolic Equivalents of Task (METs)

	Subjects	Mean Total METs (min/wk)	<i>t</i> -test <i>p</i> value
UI- (ISI < 3)	44	3452.25 ± 2542.9	0.758
UI+ (ISI ≥ 3)	4	3247.13 ± 810.8	

Total METs by Intensity per Week



PELVIC FLOOR COORDINATION

- **40%** (n=19) unable to perform lifting contraction without viewing US image
- **47%** (n=9) able to correct lifting contraction after viewing the US image

Pelvic Floor Movement			
	Bladder Floor Excursion (cm)		
	UI-	UI+	<i>t-test</i> p value
Valsalva	0.767 ± 0.596	0.964 ± 0.752	0.537
PFM Contraction	0.365 ± 0.322	0.001 ± 0.219	0.033

IMPORTANCE

- **No difference between amount and intensity of exercise between groups**
- **Significant difference in ability to perform proper PFM lifting contraction in UI+ group**
- **Motor control v. strength?**

CONCLUSIONS

- **Mechanisms of UI in young, healthy females remain unclear**
- **RTUS is great biofeedback tool for training PFM**
- **Further research needed to determine correlation between high levels of physical activity and UI**

FUTURE RESEARCH

- **Determine if high levels of physical activity can lead to moderate to severe levels of UI in a young, healthy, female population.**

ACKNOWLEDGEMENTS

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