

A Device to Prevent Female Urinary Stress Incontinence

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Sponsor: Watkins-Conti Products, Inc.

Background and Significance of Study

Stress Urinary Incontinence (SUI) and Pelvic Organ Prolapse (POP) are growing problems globally that not only cost health care systems large amounts of money, but severely degrade the quality of life (QoL) of an estimated 40 million women in the United States alone. Although surgical solutions can succeed in ameliorating symptoms associated with SUI and POP, surgery is not without risks and complications and may even leave the patient in a worse situation than before treatment (1, 2). The FDA issued a Public Health Notification regarding surgical mesh placed through the vagina (transvaginal placement) to treat POP and SUI. The FDA identified serious and frequent complications including mesh erosion through the vagina, pain, infection, bleeding, discomfort during intercourse, organ perforation, urinary problems, recurrent prolapse, neuro-muscular problems, vaginal scarring/shrinkage & emotional problems. Most surgical complications require intervention including medical, additional surgical treatment and hospitalization. The pessary, which is most commonly used for management of female POP but also has been used for SUI, does present a viable non-surgical option for treating SUI and POP. Pessaries have few complications and side effects, however these devices are traditionally placed in the vagina for weeks at a time. Ideally the design should allow for easy removal and insertion by the patient (3). Difficulty with self-removal and insertion of the pessary and loss during defecation (Colpexin) may be limiting widespread use of the devices. Currently use of pessaries equates to a life-long commitment of office visits every 2 to 3 months.

Watkins-Conti Products, Inc., has developed a simple design that solves many of these problems and could provide a simple, inexpensive solution for SUI for many women. The Collapsible Cone-Shaped Intra-Vaginal Urinary Incontinence Support Device (Yoni.Fit) from 100% medical grade silicone, places pressure on the urethral sphincter while supporting pelvic organs, thus eliminating or significantly reducing urine leakage. Inspired by the ring pessary, the simple yet effective design of the collapsible device Yoni.Fit is user friendly, light weight and less difficult to hold in the vagina than the Colpexin. Yoni.fit is believed to assist with strengthening the pelvic floor like the Colpexin while supporting anatomy like the pessary, reducing the need for invasive surgeries altogether.

In order to support applications for Small Business Innovation Research funding and for investor funding, Watkins-Conti Products proposes to demonstrate short term efficacy with patients suffering from SUI for reduced or eliminated leakage against a standardized battery of challenges as a primary endpoint. Ease of use and support of anatomy with use of Yoni.Fit will serve as secondary endpoint

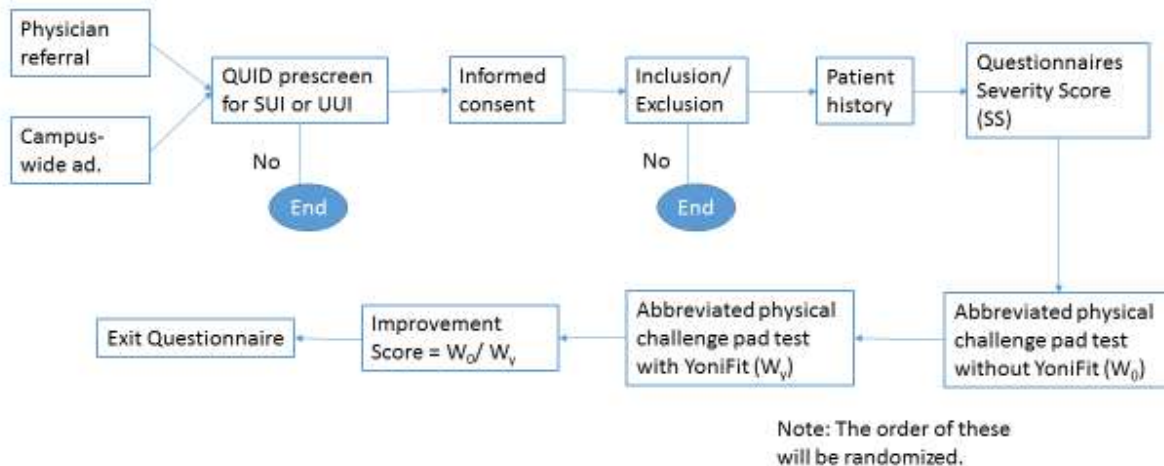
Specific Aims-

Aim: Test the acute efficacy of Yoni-Fit in a clinical trial of unselected women with incontinence in a standardized set of challenges performed with and without Yoni-Fit in place.

Protocol

The flow chart for the study is shown in the figure below.

Flow Chart for Feasibility Study



1. Subjects will be recruited in two ways. First, subjects will be referred from the patient bases of two physicians at the OUHSC who treat incontinence. These are Dr. Lieschen Quiroz of the Department of Obstetrics and Gynecology and Dr. Gennady Slobodov of the Department of Urology. The second source will be a campus-wide email announcing the study. Regardless of the method, potential subjects will be referred to Ms. Alicia Parrett, a research coordinator for the study who is employed by the Department of Urology.
2. Potential subjects will be pre-qualified by a 6-item questionnaire, the Questionnaire for Urinary Incontinence Diagnosis (QUID) (4). This questionnaire has 3 questions each referring to the seriousness of Stress Urinary Incontinence (SUI) and of Urge Urinary Incontinence (UUI). Subjects will be accepted if their SUI score is 5 or greater and is greater than the UUI score. For privacy reasons, these scores will not be retained. Subjects will then be given an appointment. Subjects will be instructed to wear comfortable athletic type wear and not to drink any fluid for two hours prior to their appointment.
3. When they appear for their appointment, subjects will be administered the informed consent. All paperwork will be pre-numbered with a code that will link to the subject name. The key will be kept confidential by the Study Coordinator. They will be instructed to empty their bladders and will be given a liter of water or other drink and instructed to drink it over a 15-20 minute time period. An abbreviated patient history will be obtained for the purpose of establishing whether the subject meets the inclusion criteria and is not disqualified by meeting the exclusion criteria. The subject will again fill out the QUID questionnaire. The inclusion criteria are a SUI score of 5 or greater, predominately SUI (SUI score > UUI score) and age between 25 and 65. Exclusion criteria are predominantly UUI, prolapse greater than mild, hysterectomy or other pelvic floor surgery other than a Caesarian section, diabetes, BMI > 35 or unable to perform ten

“jumping jack” exercises. Patients will be administered three additional questionnaires in order to compute a Severity Score. These questionnaires are the Urinary Distress Inventory (UDI), Urinary Impact Questionnaire (UIQ) and the Incontinence Severity Index (ISI). The scores will be multiplied together to provide the Severity Score.

4. Patients will then participate in an abbreviated Pad Test. This test has been validated (5). An hour after finishing the liter of liquid, the subject is given a tared incontinence pad, which is then put in place She then engages in the following mild exercise challenges..
 - a. Stand from sitting 10 times.
 - b. Cough vigorously while standing.
 - c. Bend down to pick up small object.
 - d. Perform ten jumping jacks.

The subject then will remove pad, place into bag and seal. The Experimenter will then weigh pad. The subjects will be randomized so that half will perform the Abbreviated Pad Test with the Yoni.Fit device in place followed by repeating without the device in place. The other half will perform the challenges in the reverse order.

5. The experimenter will calculate a change in score, which is the weight of the pad worn without the device in place minus the tare weight of the pad divided by the weight of the pad with the device in place minus the tare weight of the pad. In case no urine is released with the device in place, the Improvement Score will be defined as “1000”. A Release Change will also be calculated as the net weight without the device in place minus the weight with the device in place divided by the net weight released without the device in place.
6. Patients will be paid \$100 for their participation.

Data Analysis

After checking the data for correctness, the data analysis will ensue. Descriptive statistics will be calculated and include the mean, median, standard deviation The improvement scores will be correlated with the symptom scores and demographics to provide a preliminary estimate of how well the YoniFit performs and possibly to identify parameters that predict less than optimal prevention of SUI.

Budget

Item	Amount
Personnel	
Robert E. Hurst, PhD, PI	\$9,251
Alicia Parrett, Clinical Coordinator	\$3,989
Per subject costs	\$38,250
IRB application and account set-up	\$3,000
Supplies and Miscellaneous Costs	\$1,000
Total direct cost	\$55,490
Clinical trial IDC (30%)	\$16,647
Grand Total cost	\$72,137

Budget Justification

Dr. Hurst will act as overall PI for this project and will coordinate between Watkins-Conti Products and the OUHSC. He will meet with the clinicians as necessary and weekly with Ms. Parrett to assess progress and solve any problems. He will also be responsible for preparing the IRB application and for the data analysis and for preparing a report. His cost is calculated on the basis of 1 person-month (8,33% effort) on a University salary of \$80,457 plus 37.98% fringe benefits.

Ms. Parrett will act as the clinical coordinator. In addition to the per subject costs, she will also assist with preparing the IRB application, talk to patients who do not qualify, coordinate with the physicians and meet with Dr. Hurst. Her cost is calculated on the basis of a salary of \$28,907 with 10% effort plus 37.98% fringe

The per subject costs are calculated as follows. These amounts are standard charges for clinical trials.

\$120 per person for informed consent

\$100 demographics inclusion/exclusion criteria, medical history

\$100 per person for questionnaires administered

\$20 per person for height and weight

\$100 per person for subject stipend

\$125 physician recruitment - per subject recruited by referral of patients.

\$200 per person for coordinator/data management fee

\$765 total per patient costs

The standard charge for review of an IRB application is \$2500. Supplies and Miscellaneous Costs include pads, sealable bags, paper, copying and the like.

References

1. Huang W, Wang T, Zong H, Zhang Y. Efficacy and Safety of Tension-Free Vaginal Tape-Secur Mini-Sling Versus Standard Midurethral Slings for Female Stress Urinary Incontinence: A Systematic Review and Meta-Analysis. *International neurourology journal*. 2015;19(4):246-58.
2. Ellington DR, Ereksn EA, Richter HE. Outcomes of Surgery for Stress Urinary Incontinence in the Older Woman. *Clin Geriatr Med*. 2015;31(4):487-505.
3. Jones KA, Harmanli O. Pessary use in pelvic organ prolapse and urinary incontinence. *Rev Obstet Gynecol*. 2010;3(1):3-9.
4. Bradley CS, Rahn DD, Nygaard IE, Barber MD, Nager CW, Kenton KS, et al. The questionnaire for urinary incontinence diagnosis (QUID): validity and responsiveness to change in women undergoing non-surgical therapies for treatment of stress predominant urinary incontinence. *Neurourology and urodynamics*. 2010;29(5):727-34.
5. Hahn I, Fall M. Objective Quantification of Stress Urinary Incontinence: A Short Reproducible, Provocative Pad-Test. *Neurourology and urodynamics*. 1991;10:475-81.