

NEAR INFRARED SPECTROSCOPY OF PELVIC FLOOR MUSCLES SHOWS THE EFFECT OF PELVIC FLOOR MUSCLE TRAINING IN WOMEN WITH STRESS INCONTINENCE

Lynn Stothers, M.D., Andrea Marques, Ph.D., Babak Shadgan, M.D. M.Sc. Ph.D., Andrew MacNab, M.D.: Vancouver, BC Canada
(Presentation to be made by Dr. Stothers)

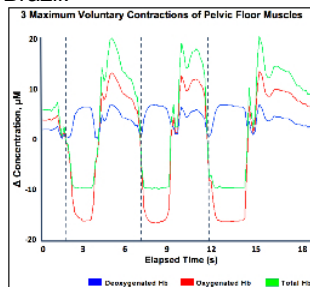
INTRODUCTION AND OBJECTIVES: Near-infrared spectroscopy (NIRS) monitors changes in muscle chromophore concentration of oxygenated (O₂Hb), deoxygenated (HHb) and total hemoglobin (tHb). In exercise science, NIRS has been used to monitor rates of muscular fatigue and to modify exercise techniques in athletes. The objective of this study was to demonstrate the feasibility of NIRS to monitor pelvic floor muscle oxygen consumption during pelvic floor muscle training (PFMT) in women with stress urinary incontinence (SUI) compared to healthy controls.

METHODS: 20 adult women consented. Measures included: voiding diary, body mass index, Incontinence Impact Questionnaire, Sports Medicine Lifestyle Classification, multichannel urodynamics, leak point pressure and Brink Score. NIRS light emitting diodes (785, 808 and 830 nm) were integrated into a vaginal probe. Subjects completed daily and in person PFMT by a PhD physiotherapist weekly x 6 weeks. NIRS was recorded during; a) 3 maximal voluntary contractions, b) 1 minute of sustained maximal isometric contraction and c) 10 rapid continuous contractions. Statistical comparison examined chromophore concentrations before and after PFMT and to controls with $p < 0.05$ as significant.

RESULTS: 82% of SUI women reported improved continence status following PFMT. SUI women responding to PFMT had a pattern of decreasing muscular O₂Hb and tHb, with an increase in HHb during each contraction. Chromophore values returned to baseline following muscle relaxation (fig 1). The magnitude of changes of O₂Hb, HHb and tHb were significantly higher after completion of the PFMT program compared to their baseline in women with improved continence. Non responding incontinent women had rates of oxygen decline >50% faster during isometric contraction compared to responders which was correlated to leak point pressure. Control women displayed statistically longer time to muscular fatigue.

CONCLUSIONS: NIRS interrogation of the pelvic floor demonstrated changes in oxygenation patterns following 6 weeks of PFMT. The feasibility of transvaginal NIRS for evaluation of pelvic floor muscle performance was demonstrated which could allow for personalized PFMT programs in women based on individual rates of muscular fatigue.

Source of Funding: PhD Postdoctoral funding while at the University of British Columbia Department of Urologic Sciences was provided by a grant from the University of Campinas, Brazil.



THE EFFECTS OF STRESS ON URINARY SYMPTOMS

Chong Choe, M.D., Michael Santomauro, M.D., Elizabeth Abou, M.A.,
Jennifer Webb-Murphy, PhD, Emily Cole, M.D.: San Diego, CA
(Presentation to be made by Dr. Choe)

Purpose: Operational stress is common among military service members. There is a paucity of research on the relationship between stress and Lower Urinary Tract Symptoms (LUTS). The objective of this study was to assess the potential impact of perceived stress and social support on LUTS among male Marine recruits enrolled in boot camp at Marine Corps Recruit Depot (MCRD) in San Diego, CA.

Methods: Participants consisted of Marine male recruits in Echo Company conducting boot camp training at MCRD San Diego, CA. The recruits completed an assessment packet consisting of the Lower Urinary Tract Symptoms Scale, the Perceived Stress Scale (PSS), the Quality of Life Index, the Satisfaction with Life Scale and Multidimensional Perceived Social Support Scale (SS) at three time points during boot camp; the initial intake evaluation during the in-processing or receiving phase (T1), the second assessment during the middle of training (T2), and the final evaluation at the termination of training prior to graduation (T3).

Results: 527 Marine recruits from ECHO Company gave consent to participate in the study. Participation was voluntary and 80% participated during three time points T1-T3. The majority of participants were between the ages of 17-20 yrs old (88.9%), unmarried (98.7%), and completed trade school/college (6.1%). The ethnic diversity mirrored that of the current US census. Only 2.5% reported having previous mental health treatments and 1.5% reported having previous urological health treatments. Significant differences were found across the three time points of boot camp training for the following measures: 1) PSS [$F(2,817)=13.7, p\leq.05$], 2) the total score of the SS [$F(2,796)=4.4, p\leq.05$], 3) the total LUTS score [$F(2,817)=13.7, p\leq.05$]. In addition, all three subscales of the LUTS 1) voiding [$F(1.8,793)=58.4, p\leq.05$], 2) storage [$F(2,848)=117.6, p\leq.05$], and 3) postmicturition [$F(2, 835)=25.2, p\leq.05$] had significant differences. Post-hoc analysis revealed that service members perceived significantly more stress (PSS) during T2 [$M=15.6, SE=.34$] compared to both T1 [$M=14.5, SE=.34$] or T3 [$M=14.0, SE=.33$]. Overall LUTS followed similar pattern as the PSS in that service members reported greater LUTS symptoms during T2 [$M=31.7, SE=.39$] compared to both T1 [$M=29.1, SE=.35$] or T3 [$M=27.9, SE=.31$], however T1 was also significantly higher than T3. Lastly regression analysis revealed that the PSS moderately predicted the LUTS outcome [$F(1,524)=85.8, p\leq.05; R=.375$]. Fourteen percent of the variation in the LUTS could be explained by the PSS. Overall the stress experienced during boot camp training appears to be greatest mid-training and it correlates with the highest levels of LUTS in male recruits.

Conclusion: To our knowledge, this is the first human study conducted which correlated perceived stress and lower urinary tract symptoms. Further research is needed to better understand the impact of increased LUTS and its occupational implications.

Source of Funding: None

REFERRED HYPERALGESIA, TACTILE ALLODYNIA, AND ICE WATER TESTING IN WISTAR RODENTS EXPOSED TO CHRONIC WATER AVOIDANCE STRESS

Una Lee, MD, Ais Wu, Joanne Leung, Rong Zhang, PhD, Sylvie Bradesi, PhD, Larissa Rodriguez, MD: Los Angeles, CA
(Presentation to be made by Dr. Lee)

Introduction: Some visceral pain disorders results from upregulation of nerves in the pelvis, spinal cord, and the brain. Interstitial cystitis/Painful Bladder Syndrome (IC/PBS), a visceral pain disorder of the lower urinary tract, might share similar pathophysiology. The objective of this study is to examine the effect of chronic water avoidance stress (WAS) on bladder referred hyperalgesia, hindpaw tactile allodynia, and bladder ice water testing in a rodent model.

Methods: Virgin female Wistar rats were exposed to chronic WAS or sham for 1hr/day for 10 days. Behavioral testing was performed before WAS or sham (baseline) and post-WAS or sham. Referred hyperalgesia and tactile allodynia was tested using von Frey filaments applied to the suprapubic region and the plantar region of the hindpaw. Frequency of withdrawal to the application of filaments to the abdomen was tested using individual fibers with the forces of 0.4, 1, 2, 4, 8, 15 g (Stoelting). Tactile allodynia was tested using filaments with forces 0.4, 1, 2, 4, 8, 15 g. The median 50% withdrawal threshold was assessed using the up-down method. 2 way ANOVA testing (SPSS) was performed with $p < 0.05$ considered significant. Cystometry was performed under anesthesia with slow filling at 100microliters/min. A suprapubic tube and bilateral rectus abdominus electromyogram (EMG) electrodes were placed under ketamine/xylazine anesthesia. Fast filling testing was performed with room temp saline at 1cc/1 sec. Ice water testing is performed with 2 degree water at 1cc/1 sec, and EMG response recorded. The animal's urethra was unobstructed allowing it to void spontaneously.

Results: Sham animals (n=8) did not demonstrate a significant difference in referred hyperalgesia responses post-stress compared to baseline. WAS animals (n=8) did demonstrate a significant difference in referred hyperalgesia responses post-stress compared to baseline ($p=0.046$). For hindpaw tactile allodynia, there was not a significant difference between the responses of sham animals at baseline and post-stress. However the WAS animals did demonstrated significantly lower withdrawal threshold post stress compared to baseline ($p=.003$). No positive EMG responses were noted during slow filling. None of the sham and 50% (4/8) WAS animals had positive fast fill and ice water test EMG responses.

Conclusions: Previous investigations have shown an increase in urinary frequency in rodents exposed to chronic water avoidance stress. The current study shows increased tactile allodynia and increased bladder hyperalgesia. The WAS model may be a promising model in the study of IC/PBS.

FMRI BRAIN RESPONSES TO PELVIC STRENGTHENING IN WOMEN WITH IDIOPATHIC URGE INCONTINENCE

Lynn Stothers, M.D.: Vancouver, Canada
(Presentation to be made by Dr. Stothers)

INTRODUCTION AND OBJECTIVES: Although neurological disease can be found in cases of urge incontinence many women experience idiopathic urge incontinence. Contraction of the pelvic floor can be employed in these patients to assist with holding against urgency, which in some cases may cause the sensation of urgency to reduce or resolve through mechanisms not fully understood. Functional-MRI (fMRI) has been employed in some studies of urge incontinence in order to better understand brain responses to bladder afferents. The objective of this study is to use fMRI with urodynamics to gain insight into the functional pathogenesis of urge incontinence and to map cortical effects in women who have completed a course of intensive pelvic floor therapy for therapy towards control of urinary incontinence.

METHODS: Women 19 years or older, who are scheduled for urodynamic testing (UDS), with diagnosed urge incontinence were recruited. Baseline measures in addition to history and physical exam included a 3-day voiding diary, urine culture and incontinence impact questionnaire (IIQ). Subjects completed 2-fMRI studies pre treatment – one with an empty bladder and the other with infusion to urge. A 1-hr pelvic floor exercise teaching session was conducted on an individual basis with the subjects instructed to complete a daily routine of 10 short pelvic floor contractions alternating with long isotonic contractions. Subjects returned for fMRI with multichannel UDS 4 weeks post-pelvic floor therapy. Urodynamics was completed using an 8 French catheter with water filling (30cc/min) until report of urgency and a sustained rise in detrusor pressure in keeping with detrusor over activity was observed.

RESULTS: 10 female subjects aged 48-60 with a mean of 1.8 daily urge incontinence episodes participated. Following 4 weeks of intensive pelvic floor exercise there was a 50% reduction in the mean number of incontinence episodes based on the voiding diary and a 38% reduction in mean IIQ scores. Multichannel UDS confirmed detrusor over activity with urge leakage in all cases. Locations of fMRI detected activation included the insula, PAG, cerebellum, thalamus and frontal cortex. Intensity of response was related to bladder volume at which detrusor overactivity with clinical urge was felt. Following treatment there were reduced changes observed in the orbitofrontal cortex.

CONCLUSIONS: The frontal cortex, specifically the orbitofrontal cortex may be important in the pathophysiology of idiopathic detrusor overactivity in adult women and may be an area whose functional contributions to control of urge incontinence may be altered.

SUCCESS OF RETROPUBIC VERSUS TRANSOBTURATOR MIDURETHRAL SLINGS IN OBESE PATIENTS

Gjanjé L. Smith, M.D., Jason M. Kim, M.D., Bhavin Patel, M.D., Adam Schatz, B.S., Ankit Singla, B.S.*, Alvaro Lucioni, M.D., Fred E. Govier, M.D., Kathleen C. Kobashi, M.D.: Seattle, WA
(Presentation to be made by Dr. Smith)

Purpose: Obesity is a risk factor for urinary incontinence¹. Retropubic (RP) and transobturator (TO) midurethral slings (MUSs) have been shown to be efficacious for treatment of female stress urinary incontinence. We examined the effect of obesity, defined as body mass index (BMI) ≥ 30 kg/m², on the success of RP versus TO MUSs.

Materials and Methods: A prospective database of all consecutive patients undergoing RP or TO MUS placement from October 2001 to September 2009 was reviewed. Each patient was mailed validated questionnaires annually in the post-operative period to assess outcomes. Outcomes were compared in patients with a minimum of 12 months follow-up. Success was defined as ≤ 1 incontinence episode/week or $\geq 70\%$ patient-reported improvement. BMI at the time of surgery was calculated using the formula weight (lbs) $\times 703/\text{height (in)}$ ². Obesity was defined as BMI ≥ 30 kg/m².

Results:

Data were available on 68 and 39 patients with a BMI ≥ 30 kg/m² who underwent RP (Group A) and TO (Group B) MUS placement, respectively. There was no significant difference in mean follow-up, valsalva leak point pressure (VLPP), or BMI between the two groups. Overall success rate was 70.6% (48/68) in Group A and 87.2% (34/39) in Group B ($p = 0.05$).

	Retropubic (Group A) N = 68	Transobturator (Group B) N = 39	p value
Follow-up (months)	42.5 \pm 18.3	42.1 \pm 15.3	0.924
VLPP (cm H ₂ O)	73.7 \pm 48.3	75.9 \pm 25.3	0.812
BMI (kg/m ²)	35.2 \pm 5.0	34.8 \pm 4.9	0.688
Success	70.6%	87.2%	0.05

Conclusion: The TO MUS may be more effective for treatment of SUI than the RP MUS in obese patients (BMI ≥ 30 kg/m²). Further investigation is needed to confirm these findings.

¹Subak LL, Richter HE, Hunskaar S. Obesity and Urinary Incontinence: Epidemiology and Clinical Research Update. J Urol 2009, 182: S2- S7.

URINARY FUNCTIONAL OUTCOMES OF ORTHOTOPIC URINARY DIVERSIONS USING A VALIDATED QUESTIONNAIRE

Vannita Simma-Chiang, M.D., Siamak Daneshmand, M.D., Jie Cai, M.S., David F. Penson, M.D., MPH, and Eila C. Skinner, MD: Los Angeles, CA
(Presentation to be made by Dr. Simma-Chiang)

Purpose: Orthotopic neobladder construction has become a well-established form of urinary diversion for patients who require radical cystectomy for malignancy. There are no randomized trials comparing the functional outcomes of different neobladders, and there is a lack of scientific evidence regarding which is the best diversion. We sought to compare urinary functional outcomes between the Studer pouch and the T-pouch.

Materials and Methods: We identified our study population using an IRB-approved, prospective database of patients who were eligible for a radical cystectomy. Between 2002 – 2009, patients eligible for orthotopic diversion were randomized to a Studer pouch or T-pouch. Surviving male patients who had at least 12 months of follow-up since surgery were mailed a validated questionnaire, the Bladder Cancer Index-Urinary Domain (BCI, Copyright © University of Michigan, 2003), including additional unvalidated questions about pad usage and mucus production. Age, BMI, time since surgery, ASA class, history of diabetes, radiation, and chemotherapy were analyzed as possible predictors of urinary function.

Results: A total of 417 male patients were recruited and randomized to undergo a Studer or a T-pouch orthotopic neobladder. The surviving 295 patients were sent questionnaires. Thirty-two (32) patients were excluded due to death, loss of follow-up, conversion of their orthotopic neobladder to a different type of urinary diversion, or refusal to participate in the study. The response rate to the questionnaire was 68% (179/263). Mean age was 70 years (range 42 to 90) with mean follow-up of 4.5 years (range 1-8 years). Of the 179 patients, 86 (48%) had Studer diversion and 93 (52%) had T-Pouch diversion. No significant differences were detected on the urinary domain, urinary function, and urinary bother between the two diversions. Diabetic patients had worse urinary function score compared to non-diabetic patients ($p=0.0017$). Patients older than 70 had worse urinary domain score ($p=0.0511$) as well as urinary function score ($p=0.0017$) than those younger than 70, although there were no differences noted in pad usage between the age groups. The urinary bother score was not affected by age or diabetes. In a multivariable linear regression model, age and DM were found to be independent predictors of the urinary function score.

Conclusions: In terms of urinary function, we did not detect any significant differences between the Studer and T-pouch orthotopic urinary diversions. Age and history of diabetes were independent predictors of urinary function, as measured by the BCI, a validated instrument. Our study provides evidence that older patients (>70) and those with diabetes who undergo orthotopic urinary diversion have worse urinary function; but no difference in bother or pad usage was detected.

Source of Funding: None

COMPARISON OF SHORT-TERM AND INTERMEDIATE-TERM OUTCOMES IN PATIENTS UNDERGOING TRANSOBTURATOR MID-URETHRAL SLING

Gjanjé L. Smith, MD, Jason M. Kim, M.D., Bhavin Patel, M.D., Adam Schatz, B.S., Ankit Singla, B.S.*, Alvaro Lucioni, M.D., Fred E. Govier, M.D., Kathleen C. Kobashi, M.D.: Seattle, WA
(Presentation to be made by Dr. Smith)

Purpose: Transobturator mid-urethral slings (MUSs) are safe and effective for treatment of female stress urinary incontinence (SUI). There is limited data regarding the long-term success of the transobturator MUS. To our knowledge, there are no prior studies evaluating the durability of success in the same patient population. Our goal was to assess the durability of the transobturator MUS by comparing outcomes in the same patient population at short-term (8 months) and intermediate-term (37 months) follow-up.

Materials and Methods: A prospective database of all consecutive patients undergoing transobturator MUS from January 2004 to September 2009 was reviewed. Each patient was mailed validated questionnaires annually in the post-operative period to assess outcomes. Data was analyzed only for those patients who returned both a short-term post-operative questionnaire and an intermediate-term questionnaire at a minimum of 12 months for comparison of differences in outcomes. Success was defined as ≤ 1 incontinence episode/week or $\geq 70\%$ patient-reported improvement.

Results: Data was available for 38 patients. The mean follow-up was 8.4 months for short-term follow-up and 37.4 months for intermediate term follow-up ($p < 0.0001$). There was a significant decrease in dry rate ($p = 0.031$) and overall success rate ($p < 0.0001$) at intermediate-term follow-up. Of the 35 patients who initially reported success at short-term follow-up, success was durable in 91.4% (32/35).

Conclusions: Success of the transobturator MUS appears to decline over time. However, overall success is still durable in the majority of patients at intermediate-term follow-up. Further studies are needed for evaluation of long-term success in order to guide pre-operative counseling of patients.

	Short-term Follow-up	Intermediate-term Follow-up	p value
Dry	41%	25.6%	0.031
Overall success	92.1%	84.2%	0.0001

DE NOVO STRESS URINARY INCONTINENCE IN PATIENTS UNDERGOING ROBOTIC ASSISTED LAPAROSCOPIC SACROCOLPOPEXY

Victor E. Grigoriev, M.D. David Abramowitz, B.S: Las Vegas Urology and Desert Incontinence Center, Las Vegas, NV
(Presentation to be made by Dr. Grigoriev)

Objective: We endeavored to evaluate *de novo* Stress Urinary Incontinence (SUI) in patients undergoing Robotic Assisted Laparoscopic Sacrocolpopexy (RALS). Sacrocolpopexy is considered best method of repairing Pelvic Organ Prolapse and with adoption of Robotic technology this procedure has become more acceptable to patients and surgeons. The need for a prophylactic sling in patients undergoing repair of pelvic organ prolapse is not determined. We report retrospectively on 32 patients undergoing RALS and resulting effect on continence, in order to determine whether prophylactic sling procedure needs to be performed in patients without SUI who are undergoing (RALS).

Methods and Materials: 32 consecutive patients undergoing RALS were analyzed. Each patient presented with pelvic organ prolapse stage III or IV, based on Pelvic Organ Prolapse Quantification (POP-Q) system. Each patient underwent standard work up which included Pelvic Floor Distress Inventory (PFDI-20), cystoscopy and multichannel urodynamic investigation. Patients who had no SUI by history and on cystoscopy and urodynamic evaluation with reduced prolapse were not offered to have sling procedure. They were warned about the risk of *de novo* SUI. Patients who demonstrated SUI were offered and consented to placement of a transobturator suburethral sling. All patients were examined at 2 weeks, 1 month and 3 months after surgery. Postoperative continence status was evaluated by direct questioning. RALS was performed utilizing IntePro™ Large Pore Polypropylene Y mesh, using permanent or delayed absorbable suture and ProTac fixation device. Monarc transobturator sling was used in patients with SUI.

Results: Mean patient age was 68.9 years (± 9.3), BMI 27.0 (range 22.0-34.7) and follow up times was 6.3 months (range 1.1-16.3). Concurrent operations included 2 total vaginal hysterectomies, 1 total laparoscopic robotic hysterectomy and 1 urethrolisis. Exposure of the mesh occurred in 2 (6%) patients and 2(6%) patient had exposure of suture material. 3 of these patients were able to have the exposed mesh and suture removed in office and 1 patient needed a second operation to remove the exposed mesh. Other complications included 1 ureteral injury and 1 DVT. 7 patients had preoperative SUI and received a transobturator suburethral sling. All 7 patients who received sling became dry. The remaining 25 patients did not have preoperative SUI and therefore did not receive a prophylactic sling. There were 2(8%) cases of *de novo* SUI in that group.

Conclusion: In our experience, patients who did not have SUI prior to RALS do not need to undergo prophylactic sling placement, as the risk of *de novo* SUI is small. Our data also shows that RALS can be performed relatively safely even in elderly and obese patients. Mesh and suture exposure are possible and larger series are required in order to make recommendations regarding preferred fixation and methods and materials.

Source of Funding: None

RESPONSE RATES TO MAILED POST-OPERATIVE QUESTIONNAIRES FOLLOWING FEMALE INCONTINENCE/PELVIC ORGAN PROLAPSE SURGERY

Jason Kim, MD, Ankit Singla, BSE, Bhavin Patel, MD, Alvaro Lucion, MD, Fred Govier, MD, Kathleen Kobashi, MD: Seattle, WA
(Presentation to be made by Dr. Kim)

Introduction: Mailed questionnaires are commonly used as tools for epidemiologic research. Mailed post-operative questionnaires have become more commonplace to assess outcomes. However, few studies have examined the response rates, especially in the long-term for mailed questionnaires following surgery. The purpose of this study is to examine response rates for mailed post-operative questionnaires and determine factors affecting the response rate.

Methods: Yearly post-operative questionnaires were mailed to patients to determine outcomes and response rates were tracked from September 2010 to March 2011. Exclusion criteria included prior patient requests to be removed from the mailing list, known incorrect addresses, deceased patients, known medical conditions precluding response (ie dementia), and patients known not to speak English.

Results: From September 2010 to March 2011, 875 patients were due for yearly post-operative questionnaires. These patients were between 1 and 17 years post-operative. Questionnaires were mailed to 570 patients. The remaining 305 patients did not have questionnaires mailed based on exclusion criteria. 30 questionnaires were returned for wrong addresses and these patients were excluded from further analysis. The overall response rate was 52.4% (283/540). Responders had a significantly older age when compared to non-responders (58 years vs. 56 patients, $p=0.32$) and average time from surgery was shorter in responders vs. non-responders (4 years, 7 months vs. 5 years, 2 months, $p=0.014$). Responders older than 60 had a higher response rate compared to their younger counterparts (58% vs. 48%, $p=0.027$). Responders younger than 40 had the lowest response rate at 37% compared to 53% in their older counterparts and this difference approached statistical significance ($p=0.078$). A weak but significant negative correlation was seen between time from surgery and response rate ($r=-0.105$, $p=0.015$). Patients who were 5 years or less following surgery had a 58% response rate compared to a response rate of 45% for those who were greater than five years following surgery ($p<0.004$)

Conclusion: Overall response rate to mailed post-operative questionnaire was 54%. Lower response rates were seen in younger patients and at longer time intervals following surgery.

REDUCING RADIATION EXPOSURE DURING UROLOGIC RADIOGRAPHIC STUDIES

Leah Y. Nakamura, M.D., Jonathan N. Warner, M.D., Paul E. Andrews, M.D., Christopher E. Wolter, M.D.: Phoenix, AZ
(Presentation to be made by Dr. Warner)

Objectives: Studies have shown that ionizing radiation from radiographic imaging studies have potential for long term harmful effects. We aimed to reduce the radiation exposure to our staff with simple measures during our office radiographic studies.

Materials and Methods: Radiographic studies performed in our urology office include retrograde urethrograms, cystograms, nephrostograms, loopograms, and voiding cystourethrograms (\pm urodynamics). In an effort to reduce radiation exposure and improve radiation safety, several changes were implemented in May 2010. Default radiation dose was decreased from 15 frames/second to 3-4 frames/second. Radiology technicians were instructed to stop using fluoroscopy to position patients. For video urodynamics, retrograde urethrograms and loopograms the majority of saved images were fluoroscopic images rather than digital spots. Digital spots were only used for one final image in retrograde urethrograms and loopograms. Patients rather than the staff were instructed to hold the speculum in place to reduce vaginal prolapse during video urodynamic studies. The staff was educated to stop capturing images to demonstrate incontinence during stress maneuvers. Average whole body radiation was examined amongst four staff members. This was compared before and after the radiation safety measures were implemented. Radiation data was collected from radiation badges which were consistently worn by all staff members.

Results: Four urology staff members performed the majority of radiologic studies in the urology department. There was no significant difference in the number of studies performed before and after the radiation safety changes were made. Badge readings were reported every 2 months by the radiation safety office. Average badge readings prior to the implementation of the radiation safety changes were taken between January and September 2009. Average whole body radiation per person was 263 mrem/period (2 months) during this time. The average badge readings after the implementation were taken between July 2010 and March 2011. The average whole body radiation per person was 45 mrem/period (2 months). There was no difference in quality or quantity of the studies between the two periods.

Conclusions: Making simple changes such as decreasing radiation dose, limiting scout films, and limiting the number of films taken/study have made marked improvements in whole body radiation exposure. This was an important measure that was taken in our department to improve radiation safety amongst the staff.

Source of Funding: None