

GUIDELINES

FELLOWSHIP PROGRAM

SOCIETY FOR URODYNAMICS AND FEMALE UROLOGY
EDUCATION COMMITTEE

2005

The Committee for Guideline Development

TABLE OF CONTENTS

PURPOSE	2
OBJECTIVE	2
PROGRAM DIRECTOR(s).....	2
PROGRAM SELECTION.....	2
PROGRAM REVIEW	2
APPLICANTS.....	3
DURATION.....	3
PROGRAM DESIGN	3
MANDATORY AND SELECTIVE MODULES	
I. Urodynamic Testing	5
II. LUTS and Urinary Incontinence in the Female.....	5
III. LUTS and Urinary Incontinence in the Male.....	6
IV. Pelvic Organ Prolapse.....	6
V. Neurogenic Voiding Dysfunction	8
VI. Genitourinary Reconstruction	9
VII. Appendices	10
Appendix 1	10
Appendix 2	11
Appendix 3	15
Appendix 4	16
Appendix 5	16
Appendix 6	19
Appendix 7	20
Appendix 8	21
Appendix 9	22

PURPOSE

Provide standardized guidelines for a fellowship program in urodynamics, incontinence, neurogenic bladder dysfunction, female urology, and pelvic floor/voiding dysfunction in men and women to advance knowledge and skills in this field of specialization beyond the requirements needed for board eligibility/board accreditation in urology.

OBJECTIVE

To establish fellowships across the country that provide advanced training in urodynamics, female urology, incontinence, male and female voiding dysfunction, neurourology and pelvic reconstruction thereby improving patient care, outcomes and the quality of life for our patients.

PROGRAM DIRECTOR

- Board Certified/Recertified Urologist
- Fellowship trained in Urodynamics and Female Urology or widely accepted as a senior expert in the field (must petition SUFU Fellowship Committee)
- At least 5 years of clinical experience after completion of an approved (eventually accredited) fellowship program
- Evidence of academic productivity (papers, presentations, grants)
- Letter of support for the program director and fellowship program from the division/department chairman with a description of the facilities and division/departmental resources available to support the program
- Direct responsibility for education and supervision of the fellowship training program
- Annual summary report for each program presented to the Executive Committee at the annual SUFU winter meeting
(Due by December 31st of each year to the Education Committee)
- Program Director is responsible for submitting evidence of scholarly activity by the fellow(s).
 - For example, an annual summary report for each program presented to the Executive Committee at the annual SUFU Winter meeting (due by December 31st each year)...and,
 - For example, Program Director is responsible for submitting evidence of scholarly activity by the fellow(s)

PROGRAM SELECTION

- Application submission to SUFU by the program director (**December 1, 2005**)
- Application review by the Education Committee on a semi-annual basis
- Site visit by one member of the Education Committee
- Recommendation for approval/probation/disapproval to the Executive Committee by the chairman of the Education Committee following the Education Committee application review and site visit
- Approval at the Winter Meeting by the Executive Committee will result in 3 year fellowship program certification

PROGRAM REVIEW

- Annual review by the Education Committee
- Program Director will provide the Education Committee (prior to the annual Winter meeting, by December 31st) information on each fellowship trainee to include submission of all abstracts and peer-reviewed papers (submitted, accepted), awards

- Program Director will provide the Education Committee (prior to the annual Winter meeting) with a Faculty update to include submission of all abstracts and peer-reviewed papers (submitted, accepted), grants, awards
- Program site visit required for SUFU certification and as required by the Education Committee

APPLICANTS

- Completion of ACGME approved urology residency program or foreign equivalent

DURATION

- Fellowship – 2 years
Based on module selection, each program will submit their specific curriculum for the individual fellowship program

PROGRAM DESIGN

- Based on module selection, each program must submit their specific curriculum, with the program application, for their individual fellowship program
- All programs must do:
 - Urodynamics
 - LUTS and Urinary Incontinence in the Female
- Programs must choose 2 of 4 remaining modules:
 - LUTS and Urinary Incontinence in the Male
 - Pelvic Organ Prolapse
 - Neurogenic Voiding Dysfunction
 - Genitourinary Reconstruction
- Dual application and participation in the joint ABU/ABOG Female Pelvic Medicine and Reconstructive Surgery is encouraged
- All fellowship programs must provide a core knowledge curriculum
 - For example:
 - Case conferences
 - Selected reading lists
 - Journal Clubs and/or review of current literature
 - Selected textbooks and AUA Updates
- In addition to training in 2 mandatory and 2 selected modules, all programs must provide **core knowledge and clinical experience** in the following areas:
 - Female (male) pelvic and genital anatomy to include the bony pelvis, soft tissue, viscera, fascia, and ligamentous structures
 - Vascular and neural supply to the pelvis, pelvic organs and genitalia
 - Functional anatomy to include continence mechanisms for the bladder, urethra and anus
 - Physiology, neural control and pharmacology of the lower urinary tract
 - Classification of lower urinary tract dysfunction
 - Female reproductive and endocrine physiology

*see Appendix 1

- Pathophysiology of Urinary Incontinence
 - Stress urinary incontinence
 - Urge urinary incontinence
 - Mixed urinary incontinence
 - Postprostatectomy incontinence
 - Other causes for incontinence
 - Pathophysiology of lower urinary tract voiding and storage symptoms
*see Appendix 2
 - Female sexual function and dysfunction
 - Male sexual function and dysfunction
 - Childbirth and delivery effects on the lower urinary tract
 - Diagnosis and treatment of benign male and female genital disorders (vaginitis, endometriosis, uterine masses, stricture disease, BPH, interstitial cystitis)
 - Detailed history and physical examination of the male and female including the neurourologic exam and testing
 - Laboratory evaluation
 - Micturition diaries and pad testing
 - Cystourethroscopy and instrumentation
 - Urodynamic Testing
 - Imaging – ultrasound, CT scan, MRI, fluoroscopy
 - Behavioral and pelvic floor rehabilitation
 - Pharmacological Therapy
 - Neuromodulation
 - Surgical Treatment of Incontinence and Obstruction
 - Clinical Trial Design and Statistical Evaluation
*see Appendix 3
- Demonstrate academic productivity by submitting annually, to the Education Committee, a copy of manuscripts published, submitted and/or in press and/or any other work(s) in progress
 - Demonstrate scientific integrity and ethical behavior
 - Semi-annual fellow evaluations and annual faculty evaluations by the fellows (to be kept on file for review of each approved fellowship program)
 - Annual meeting with all fellowship program directors held concurrent with the annual SUFU Winter meeting to review progress, monitor and address issues with the guidelines.
 - Probation – Significant deficiencies or deviations from the fellowship guidelines or unethical behavior by program members may lead to a probationary period for up to 18 months. Failure to correct identified problems during the probationary period will lead to loss of the program.
 - Grievance Issues – grievance issues by a program will be addressed to the Education Committee chairman. Failure to resolve grievances will be reported to the SUFU President and Executive Committee.
 - Upon completion of the fellowship, as agreed upon by the program director and SUFU (in accordance with the fellowship guidelines), a fellowship certificate will be issued to the fellow.

Mandatory Modules

I. URODYNAMIC TESTING

Requirements

The preceptor/fellow will acquire knowledge and skills in complex urodynamic testing to include simultaneous multichannel bladder and urethral pressure recording with fluoroscopic imaging. Appropriate use of concurrent electromyographic recording and/or neurophysiological testing should be included to augment evaluation of lower urinary tract function.

The fellow will be able to:

- A. Perform and interpret multichannel urodynamic testing to include cystometry, pressure flow studies, dynamic urethral pressure profilometry, leak point pressure measurement and electromyography of the external urethral sphincter.
- B. Choose the appropriate indications for urodynamic testing including the level of complexity and specific tests needed to answer the diagnostic problem.
- C. Recognize artifacts and pitfalls of urodynamic testing.
- D. Understand variations in techniques and urodynamic instrumentation.
- E. Understand the various methods for computer assisted analysis of voiding function.
*see Appendix 4

II. LOWER URINARY TRACT SYMPTOMS (LUTS) AND URINARY INCONTINENCE IN THE FEMALE

Requirements

The fellow will understand the pathophysiology of LUTS and urinary incontinence (UI) and their many presentations. In-depth knowledge will be required to make an accurate diagnosis and treatment plan including the use of pharmacologic agents, behavioral therapy/pelvic floor rehabilitation, neuromodulation and surgical reconstruction.

The fellow will be able to:

- A. Develop a comprehensive history to include specific details of the type and severity of LUTS and UI.
- B. Perform a complete examination with directed attention to the pelvic examination in women.
- C. Use and understand the diverse ancillary methods to quantitate LUTS and UI including voiding diaries, pad testing, and quality of life instruments.
- D. Choose appropriate urodynamic and diagnostic techniques to aid in the accurate diagnosis of LUTS and UI.
- E. Discuss and implement behavioral treatment for LUTS and UI. Describe the range of therapies available (timed voiding, biofeedback, pelvic floor muscle rehabilitation, electrical stimulation) and the expected benefit from each therapy.
- F. Understand and prescribe appropriate pharmacologic agents to treat LUTS and UI. Describe the mechanism of action, effectiveness and side-effects of each medication along with the treatment plan for patients refractory to conventional pharmacologic therapy.

- G. Describe the indications and contraindications to surgical procedures and neuromodulation techniques for treating LUTS and UI.
- H. Perform surgical procedures to treat LUTS and/or UI including periurethral or transurethral bulking injections, retropubic urethropexy (MMK, Burch, paravaginal repair), artificial urinary sphincter implantation, female sling procedures.
- I. Evaluate and manage postoperative complications from all procedures used to treat LUTS and UI.
*see Appendix 5

Selective Modules

III. LOWER URINARY TRACT SYMPTOMS AND INCONTINENCE IN THE MALE

Requirements

The fellow will understand a broad range of voiding dysfunctions to include prostate mediated urethral obstruction, postprostatectomy incontinence, iatrogenic urethral obstruction, prolapse mediated urethral obstruction, and detrusor underactivity with or without associated uninhibited detrusor activity.

The fellow will be able to:

- A. Take a specific history to define the voiding dysfunction. This will include the use of voiding diaries and/or pad
- B. Describe the anatomy and pathophysiology associated with male incontinence including bladder, urethral and combined causes.
- C. Utilize testing to better define the condition.
- D. Perform a physical examination to elicit incontinence, diagnose associated prolapse, estimate prostate size or detect subtle neurologic deficits.
- E. Diagnose and manage urethral obstruction including prostate-mediated obstruction, primary bladder neck obstruction and dysfunctional voiding.
- F. Diagnose and manage postprostatectomy incontinence secondary to radical prostatectomy or transurethral resection.
- G. Utilize appropriate urodynamic and diagnostic testing to accurately diagnose voiding dysfunction.
- H. Determine upper urinary tract risk, use imaging techniques to assess pathological disease and perform endoscopy to assess anatomic obstruction or abnormality.
- I. Develop individualized management plans to facilitate bladder emptying and storage. Treatments to include intermittent catheterization, pharmacologic therapy, transurethral incision or resection of the prostate, implantation of the artificial urinary sphincter, injection therapy and urethrolisis.
- J. Discuss the risks and benefits of all treatment options and understand the cost implications of these decisions as well.

IV. PELVIC ORGAN PROLAPSE

The fellow will thoroughly understand pelvic organ prolapse and the anatomic defects associated with loss of pelvic organ support. They will implement treatment based on accurate examination and diagnostic information and perform corrective/reconstructive surgery to correct pelvic organ prolapse.

- A. Take a detailed history to describe the symptoms of pelvic organ prolapse, urethral diverticulum and urinary fistulas. The fellow etiologies of vesicovaginal and urethrovaginal fistula and diverticulum of the urethra due to the following etiologies: obstetrics, operative injury, malignancy, radiation, trauma, miscellaneous.
- B. Be familiar with concurrent diseases/procedures that may impact the diagnosis and treatment of pelvic organ prolapse (benign uterine diseases, hysterectomy, parity, deliveries).
*see Appendix 6
- C. Assess bowel symptoms including fecal incontinence (discomfort, incomplete emptying, digital manipulation).
*see Appendix 7
- D. Assess sexual function symptoms including dyspareunia, degree and satisfaction with sexual activity.
- E. Perform a physical examination to include a comprehensive pelvic examination to describe all anatomic defects and grade the pelvic prolapse using an established grading system.
- F. Utilize diagnostic techniques to aid in the diagnosis and staging of pelvic organ prolapse. To include endoscopy, electromyography and nerve conduction velocity testing, urodynamic studies with prolapse reduction and imaging (fluoroscopy, ultrasound, CT scanning, MRI).
- G. Describe non-surgical management of prolapse and institute hormone replacement, pelvic floor rehabilitation (pelvic muscle exercises, galvanic stimulation, physiotherapy) and pessary management when appropriate.
- H. Perform pelvic organ prolapse surgery and repair anatomic defects. Recognize the importance of examination under anesthesia prior to the start of a procedure.
- I. Perform the surgical techniques listed below. Describe possible intraoperative complications, their prevention and management. Cite published, immediate, and long-term success rates as a primary or secondary procedure.
- J. Recognize postoperative complications and their management. Discuss possible long-term complications and their management. Evaluate critically the quality of studies that establish success of procedure. Be able to describe and perform:
 - 1. Abdominal
 - a. closure or repair of enterocele
 - b. transabdominal sacrocolpopexy
 - c. paravaginal repair
 - 2. Vaginal
 - a. transvaginal hysterectomy with or without colporrhaphy
 - b. anterior and posterior colporrhaphy and perineorrhaphy
 - c. paravaginal repair
 - d. Manchester operation
 - e. enterocele repair
 - f. vaginal vault suspension
 - g. colpocleisis
 - h. retro-rectal levator plasty and post anal repair
- K. The fellow must describe the etiology of rectovaginal fistula formation due to the following etiologies:
 - 1. congenital
 - 2. obstetric
 - 3. trauma
 - 4. radiation
 - 5. inflammatory bowel disease
 - 6. primary, recurrent or metastatic neoplastic disease

- 7. miscellaneous
- L. The fellow should know how to perform the precise operative repair of a rectovaginal fistula which will vary with location, size, number and etiology of the rectovaginal fistula.
*see Appendix 8
- M. Discuss intraoperative and postoperative complications of each procedure and how these complications are managed. The fellow must be aware of the potential for intraoperative injuries to the pelvic viscera and know the appropriate preoperative and postoperative means to prevent and/or correct these injuries.
- N. Critically evaluate the long-term efficacy of operative therapy for pelvic prolapse and fecal incontinence.

V. NEUROGENIC VOIDING DYSFUNCTION

Requirements

The fellow will have an in-depth understanding of neurogenic conditions affecting the lower urinary tract. This knowledge will allow the fellow to diagnose, treat and implement a bladder management plan for patients with neurogenic vesicourethral dysfunction. The fellow will be able to utilize complex urodynamic testing to diagnose and manage neurogenic voiding dysfunction.

The fellow will be able to:

- A. Take a detailed history with emphasis on the neurogenic condition and an understanding of the lesion type, extent, and deficits (Spinal Cord Injury, ASIA classification, Multiple Sclerosis, Parkinson's Disease, Cerebrovascular Accident, Diabetes, Spinal Dysraphism).
- B. Perform an accurate physical exam with attention to the neurologic examination (sensory, motor, reflexes, BCR).
- C. Utilize appropriate urodynamic and diagnostic testing to classify vesicourethral dysfunction in patients with a neurogenic bladder.
- D. Determine upper tract risk (compliance, reflux) and use imaging modalities to assess renal and ureteral integrity and function (ultrasound, CT imaging, perfusion testing).
- E. Develop individualized management plans to optimize upper urinary tract function by implementing intermittent catheterization, pharmacologic therapy for compliance loss and detrusor overactivity, augmentation enterocystoplasty, continent abdominal stoma reconstruction, detrusor myomectomy, transurethral sphincterotomy, urethral closure and sling surgery for functional closure of the urethra.
- F. Understand and manage the risks of associated conditions including stone formation, renal insufficiency, decubitus ulcers, sexual dysfunction, sepsis, incontinence, bowel dysfunction and autonomic dysreflexia.
- G. Perform reconstructive and corrective surgery for neurogenic vesicourethral dysfunction. To include continent augmentation cystoplasty, augmentation enterocystoplasty, Mitrofanoff procedures, detrusor myomectomy, urinary diversion, transurethral sphincterotomy, ileovesicostomy, transurethral stent placement and prosthetics for managing incontinence and/or erectile dysfunction.
- H. Understand and manage the complications of operative intervention including urine leak, bowel obstruction, recurrent incontinence and/or persistent obstruction.
*see Appendix 9

VI. GENITOURINARY RECONSTRUCTION

Requirements

The fellow will have an in-depth understanding of the principles, conditions, techniques, and diseases effecting pelvic organs and external genitalia in male and female patients. This knowledge will allow the fellow to diagnose, treat and implement a plan of treatment for a variety of disease induced, treatment induced and congenital conditions effecting the pelvic organs. The fellow will be able to utilize a variety of complex diagnostic, medical and surgical treatments for these conditions.

The fellow will be able to:

- A. Take a detailed history with emphasis on the reconstructive problem and contributing factors that may alter treatment. These conditions would include, urethral stricture disease, congenital and acquired penile deformities, complex loss of external tissues of the external genitalia, penile, vaginal, and bladder reconstruction, cancer treatment related abnormalities of the lower urinary tract and external genitalia.
- B. Perform an accurate physical exam with attention to the external genitalia and contributing factors to accomplish a successful reconstruction (ie available tissues, alteration in vascular supply, orthopedic injuries, rectal or lower urinary tract compromise).
- C. Utilize appropriate diagnostic testing to assess the variety of conditions as needed (ie urodynamics, vascular testing, three dimensional imaging, and endoscopy).
- D. Develop an understanding as to how to approach these problems and when to use a team of surgeons.
- E. Develop technical expertise in the use of grafts, flaps, harvest techniques, use of prosthetics for genital and soft tissue reconstruction, and perfect the use of reconstructive techniques intra-operatively.
- F. Understand and manage the risks of these potentially complex reconstructive procedures.
- G. Perform urethral reconstruction using the spectrum of available techniques for anterior and posterior urethral stricture. Have exposure to the variety of post-radical prostatectomy reconstructive challenges.
- H. Perform penile reconstructive procedures associated with curvature, penile loss and erectile dysfunction.
- I. Perform vaginal reconstruction associated with congenital and acquired vaginal deficiency.
- J. Perform complex lower urinary tract reconstruction secondary to trauma and treatment related dysfunction to create a functional lower urinary tract. (i.e. appropriate use of bowel, continent diversion, bladder replacement)
- K. Perform large tissue transfer procedures, likely in conjunction with plastic surgery to repair significant tissue defects.
- L. Develop the expertise to apply reconstructive principles to treat unique or unusual problems by being creative and comfortable with the spectrum of techniques available.
- M. Understand and manage the complications of operative intervention including partial tissue loss, urine leak, bowel obstruction, recurrent incontinence, prosthetic infection.

APPENDIX 1

- A. The physiology of micturition and storage, which includes the
 - 1. Neurologic influences that control the
 - a. Central nervous system pathways and centers that modulate lower urinary tract function.
 - b. Influence of sympathetic and parasympathetic neural activity on urinary tract structure and function.
 - c. Role of adrenergic, cholinergic, and the putative role of nonadrenergic, non-cholinergic neurotransmitters on lower urinary tract function.
 - d. Visceral and somatic efferent and afferent neural pathways of the lower urinary tract.
 - 2. Anatomical factors which affect
 - a. Continence and micturition.
 - b. The normal urethral sphincter mechanism at rest and with physical stress.
 - 3. Pharmacologic and endocrine factors which affect urinary function, including the specific action(s) of
 - a. Pharmacological agents.
 - b. Estrogen and progesterone and the mechanisms by which these are mediated.
- B. The physiology of colo-rectal-anal function which includes:
 - 1. Neural influences associated with:
 - a. The central, spinal and supraspinal somatic and autonomic motor and sensory neural networks which direct and control colo-rectal-anal function.
 - b. The effects of loss of neural activities on colo-rectal-anal function.
 - 2. Anatomical factors which govern
 - a. Anatomic relationships with colo-rectal-anal function.
 - b. The effects of anatomic alterations on colo-rectal-anal function.
 - 3. Pharmacological factors and the influence of pharmacologic and dietary agents on colo-rectal-anal function.
 - 4. Extrinsic pathologic factors and their influence on colo-rectal-anal function in various age groups.
- C. Vaginal function which includes:
 - 1. Physiologic functions that govern
 - a. Normal function of the vagina in women of reproductive and postmenopausal years.
 - b. The effects of estrogen and progesterone on vaginal function.
 - 2. Anatomical factors that affect function of the vagina in women in reproductive and postmenopausal years.
 - 3. Sexual function and the
 - a. Normal physiologic response to sexual stimulation in women in the reproductive and postmenopausal years.
 - b. Influence of sex hormones on sexual function in reproductive and postmenopausal years.
 - c. Effects of pharmacologic agents on vaginal function.

**FOR MALE MODULES (III, V, VI)

- D. Prostate function which includes:
 - 1. Anatomy and embryology
 - 2. Pathophysiology of benign growth
 - 3. Physiology to include:
 - a. Innervation of the prostate and accessory organs
 - b. Neurotransmitters and receptors
 - c. Influence of growth on urethral function
 - 4. Effects of pharmacologic agents on prostate function.

APPENDIX 2

Irritative Conditions of the Genitourinary Tract

Urinary Tract Infections

- A. Understand and be able to define the following definitions:
 - 1. Asymptomatic bacteriuria
 - 2. Acute bacterial cystitis
 - 3. Acute bacterial urethritis
 - 4. Pyelonephritis
 - 5. Reinfection
 - 6. Persistent infection
 - 7. Relapse of infection
- B. Be able to describe the role of each of the following pathophysiologic factors in the prevention or the development of urinary tract infections:
 - 1. Normal genitourinary tract flora including differences between the flora of reproductive age and postmenopausal women
 - 2. The source and composition of urinary tract pathogens leading to acute cystitis and/or acute pyelonephritis
 - 3. Predisposing risk factors for the development of urinary tract infections
 - 4. Host defense mechanisms which serve to prevent urinary tract infections
 - 5. Bacterial properties which determine bacterial virulence and the type of infections
 - 6. The differences between uncomplicated and complicated urinary tract infections
 - 7. The effect of pregnancy on the natural history of urinary tract infections
 - 8. The role of coitus and/or contraceptive method on the development of urinary tract infections
- C. Understand and be able to discuss:
 - 1. The differential diagnosis of acute dysuria, urgency and frequency symptoms. The fellow should be able to differentiate dysuria due to external vulvar irritation from dysuria due to acute urinary tract infections.
 - 2. The different methods for collecting a urine specimen, the accuracy of these methods and the potential errors in collection or processing of specimens.
 - 3. The techniques and accuracy of dipstick screening for pyuria, hematuria and/or bacteriuria.
 - 4. The techniques, interpretation and accuracy of microscopic urinalysis for pyuria, hematuria and/or bacteriuria.
 - 5. Quantitative urine cultures and the
 - a. Source of the specimen and the techniques of processing it.
 - b. Interpretation of colony counts; i.e., the significance of 10⁵cfu versus 10²cfu per mL in symptomatic women.
 - 6. The role of other cultures for genitourinary tract organisms such as chlamydia, mycoplasma and ureaplasma in the evaluation of dysuria, urgency and frequency syndromes.
 - 7. The appropriate indications for invasive testing of the urinary tract using
 - a. Cystourethroscopy.
 - b. Intravenous pyelography.
 - c. Retrograde studies.
 - d. Localization studies.
- D. Know the rationale for the choice of the appropriate treatment of urinary tract infections. This should include the indications, contraindications, appropriate pharmacologic agents, therapeutic dosages and common side effects for the following therapeutic regimens:
 - 1. Single-dose therapy.
 - 2. Short-term therapy (3 days) in uncomplicated urinary tract infections.
 - 3. Traditional 7-10 day therapy.
 - 4. Low-dose prophylactic therapy (postcoital versus nightly prophylaxis).

5. Full-dose prolonged suppressive therapy.
 6. Non-antimicrobial agents such as urinary acidifiers and analgesics.
 7. Patient self-monitoring and initiation of antibiotic therapy.
- E. Be able to manage asymptomatic bacteriuria in the elderly. The fellow should be able to describe the diagnosis, limited indications for treatment and the choice of the appropriate antibiotics for elderly women with asymptomatic bacteriuria.
- F. Be able to manage catheter-associated urinary tract infections. The fellow should:
1. Be able to describe techniques for the care of indwelling catheters that may postpone the development of an acute infection.
 2. Be able to outline the advantages and disadvantages of an indwelling catheter versus clean intermittent self-catheterization in the management of urinary retention.
 3. Know the limited indications for antimicrobial therapy in women with indwelling catheters and/or who perform clean intermittent self catheterization.
- G. Be able to treat urinary tract infections in pregnancy. The fellow must be able to discuss the differences in the evaluation and management of pregnant and non-pregnant women with urinary tract infections, specifically addressing the:
1. Diagnosis of asymptomatic bacteriuria and
 - a. The effects of asymptomatic bacteriuria on perinatal morbidity and mortality.
 - b. The role of routine screening urine cultures in pregnancy.
 - c. The indications and pharmacologic agents used for treating asymptomatic bacteriuria in pregnancy.
 2. Appropriate pharmacologic agents and duration of therapy for treating pregnant women with urinary tract infections.
 3. Indications and appropriate medications for prophylactic versus suppressive antimicrobial therapy in pregnancy.
 4. Treatment of acute pyelonephritis in pregnancy and the possible fetal and maternal risks of this disease.
 5. Indications for invasive testing in the pregnant woman with recurrent urinary tract infections.

Sensory Disorders of the Bladder and Urethra

Interstitial Cystitis

- A. Able to discuss the proposed theories and the quality of the scientific data regarding the pathophysiology of interstitial cystitis including, but not limited to:
1. Autoimmune or allergic disorders.
 2. Defects in the protective glycosaminoglycan layer of the bladder epithelium.
 3. Reflex sympathetic dystrophy of the bladder.
 4. The role of dietary factors on the development or exacerbation of interstitial cystitis.
- B. Able to diagnose interstitial cystitis and be able to:
1. Explain the limitations of the diagnostic criteria for interstitial cystitis.
 2. Describe the clinical presentation of interstitial cystitis, including the definitions of urgency, frequency and nocturia as currently outlined by the International Continence Society.
 3. Describe the steps for excluding other irritative conditions of the bladder, urethra and pelvis.
 4. Cite the NIH criteria for the diagnosis of interstitial cystitis.
 5. Interpret the urinary diary of a woman with interstitial cystitis.
 6. Perform cystourethroscopy and bladder biopsy under anesthesia.
 7. Interpret correctly the cystoscopic findings and pathologic changes of early and "classic" interstitial cystitis.
 8. List the indications for and be able to perform and correctly interpret urodynamic tracings in women with interstitial cystitis.
- C. Be aware of the limitations of the literature which address the different treatment modalities for interstitial cystitis.

- D. Able to describe the indications, techniques, limitations and side effects for:
1. Hydrodistention of the bladder under anesthesia.
 2. Bladder instillation.
 3. Systemic therapy including
 - a. Immunosuppressive agents, such as corticosteroids or azothiaprine.
 - b. Antihistamines.
 - c. Anti-inflammatory agents.
 - d. Sodium pentosanpolysulfate.
 4. Comprehensive pain management.
 5. Endoscopic surgical procedures. The fellow also should be aware of the indications and techniques for performing
 - a. Transurethral resection and fulguration.
 - b. Nd:YAG laser techniques.
 6. Open surgical procedures. The fellow should be aware of the indications and techniques for performing
 - a. Denervation procedures, such as presacral neurotomy or cystolysis.
 - b. Bladder augmentation procedures.
 - c. Urinary diversions.

Urethral Syndrome

- A. Cite the currently accepted definition of urethral syndrome.
- B. Discuss the proposed theories regarding the pathophysiology of urethral syndrome including, but not limited to:
 1. Infections with fastidious organisms.
 2. Inflammation leading to obstruction of the periurethral glands and chemical urethritis.
 3. Allergic or hypersensitivity response to contact irritants.
 4. Levator myo-fascial syndrome.
 5. Urethral instability.
 6. Urethral stenosis.
 7. Hypoestrogenic urethritis.
 8. Psychogenic etiology.
- C. Describe the diagnostic approach to urethral syndrome, including characteristic subjective symptoms.
- D. Interpret the urinary diary of a woman with urethral syndrome.
- E. Describe the role of urine, urethral and cervical cultures, including cultures for chlamydia, mycoplasma and ureaplasma.
- F. Perform cystourethroscopy and correctly interpret the findings in women with urethral syndrome.
- G. List the indications for and be able to perform and correctly interpret urethrocystometry and uroflowmetry in women with urethral syndrome.
- H. Describe the differential diagnosis of urgency and frequency symptoms.
- I. Describe the limitations of the literature which address the therapeutic modalities for urethral syndrome.
- J. Discuss the indications, techniques, response rates and side effects of
 1. Urethral dilation and massage.
 2. Continuous long-term antimicrobial therapy.
 3. Estrogen replacement in postmenopausal women.
 4. Pharmacologic therapy with alpha-adrenergic agonists, antagonists and/or skeletal muscle relaxants.
 5. Biofeedback.
 6. Electrical stimulation.
 7. Chronic pain management.
 8. Urethrolisis.

Urgency and Frequency

- A. Cite the current International Continence Society definition of sensory urgency and understand the lack of standardized cystometric parameters required to define normal and/or hypersensitive detrusor function.
- B. Describe the proposed theories for the etiology of this condition, including, but not limited to:
 1. Psychogenic causes such as stress or anxiety reactions.
 2. Sub-threshold uninhibited detrusor contractions.
 3. Early form of interstitial cystitis.
- C. Describe the indications, characteristic findings and limitations of the following methods that may be used to diagnose sensory urgency and frequency syndrome:
 1. Clinical symptoms
 2. Urinary diary
 3. Postvoid residual measurement
 4. Urine, urethral and cervical cultures
 5. Cystometry
 6. Cystourethroscopy
 7. Urethral electric conductance
- D. Cite the indications, techniques, response rates and side effects of
 1. Bladder retraining.
 2. Biofeedback.
 3. Pharmacologic agents including
 - a. Anticholinergics.
 - b. Spasmolytics.
 - c. Sedatives.
 - d. Antidepressants.

Non-urologic Irritative Conditions of the Pelvis

- A. Cite the non-urologic causes of urgency, frequency and pain syndromes and be able to:
 1. Diagnose and manage acute and recurrent vulvovaginitis due to
 - a. Infections.
 - b. Allergic and/or hypersensitivity reactions.
 - c. Vulvar manifestations of systemic dermatologic conditions.
 2. Describe the differential diagnosis and management of vulvodynia due to
 - a. Dermatoses.
 - b. Papillomatosis.
 - c. Vestibulitis.
 - d. Candida and/or cyclic vulvitis.
 - e. Essential vulvodynia.
 3. Describe the etiology, diagnosis and treatment of irritable bowel syndrome.

APPENDIX 3

Statistics

- A. Design an appropriate study to analyze differences and results produced by two therapeutic regimens. Thus, the fellow should be able to
 - 1. Define the problem.
 - 2. Set up the hypothesis (null hypothesis).
 - 3. Define the operational terms (criteria).
 - 4. Determine the sample size with appropriate statistical analysis.
 - 5. Know the limitations of the study.
 - 6. Draw inferences appropriately.
 - 7. Arrive at valid conclusions based on the study.
 - 8. Identify sampling bias.
- B. Relate types of distribution to appropriate methods of analysis; understand the difference between prevalence and incidence; understand the definition and meaning of false positive, false negative, positive predictive value, sensitivity, and specificity.
- C. Describe the appropriateness of sample size to method of statistical analysis; understand definition and interpretation of mean, mode, normal distribution, and standard deviation. In addition, be able to define and interpret the meaning of Type I error (alpha error) and Type II error (beta error).
- D. Use appropriate statistical methods to determine if differences between study populations are significant.
- E. Understand the differences between parametric and non-parametric analytical techniques and apply them appropriately.
- F. Distinguish between cure rate and corrected rate.
- G. Describe the life table method of recording results and discuss limitations.
- H. Define and describe the use of
 - 1. Chi-square.
 - 2. T-test.
 - 3. Correlational analysis.
 - 4. Analysis of variance.
 - 5. Regression analysis (simple and multiple).
 - 6. Odds ratio.
- I. Describe the meaning and use of the term "significant".
- J. Describe the meaning and use of the term "confidence interval".
- K. Interpret reported research findings and discuss potential limitations.

Research and Scholarly Publications

- A. State hypothesis and describe what
 - 1. The study objectives were.
 - 2. Population was studied.
 - 3. Population the investigators intended to apply their findings.
- B. Design of the investigation and explain if:
 - 1. The study was an experiment case control study, randomized, clinical trial planned observation, or a retrospective analysis of records.
 - 2. There were possible sources of sample selection bias.
 - 3. There was a comparable control group.
 - 4. The statistical (study) power was adequate.
- C. Observations including whether
 - 1. There were clear definitions of the terms used; i.e., diagnostic criteria, inclusion criteria, measurements made and outcome variables.
 - 2. The observations were reliable and reproducible.
 - 3. The sensitivity, specificity, and predictive values of the methods were accurately applied if required.

- D. Presentation of findings, including whether
 1. The findings were presented clearly, objectively and in sufficient detail.
 2. The findings were internally consistent; i.e., the numbers added up properly and the different tables could be reconciled, etc.
- E. Analysis of results, including whether
 1. The data were worthy of statistical analysis. If so, were the methods of analysis appropriate to the source and nature of the data?
 2. The analyses were correctly performed and interpreted.
 3. There were sufficient analyses to determine whether “significant” differences might, in fact, be due to a lack of comparability of the groups; i.e., age, sex, clinical characteristics, or another relevant variable.
 4. The design of the study was appropriate for solving the stated problem.
 5. Proper statistical techniques were used.
 6. There was mention of the type of test used or the significance.
 7. There was use of measured sensitivity without specificity.
- F. Conclusions or summary, including whether the conclusions were
 1. Justified by the findings.
 2. Relevant to the hypothesis.
- G. Redesign of the study and if the study could be improved. The fellow should be able to suggest a revised experimental design that would provide reliable and valid information relevant to the question under study.
- H. Breadth and depth of subject matter; e.g., the fellow should be knowledgeable about the reference or cited material.

APPENDIX 4

Urodynamic and Neurophysiologic Tests for Urinary Incontinence and Lower Urinary Tract Dysfunction

- A. Simple single channel office cystometry
- B. Multi-channel electronic cystometry
- C. Urethral pressure profilometry
- D. Leak point pressures
- E. Uroflowmetry (simple, instrumented pressure flow studies)
- F. Urethral and anal sphincter electromyography
- G. Neurophysiologic studies (e.g., evoked potentials, terminal motor latency, fiber density, wave form analysis)
- H. Complex fluorourodynamic testing with interpretation of voiding cystourethrography in the male and female

APPENDIX 5

Treatment of Urinary Incontinence in the Female (excluding fistula and diverticulum)

Surgical Treatment

The fellow must know and understand the indications for each of the procedures listed:

- A. Continence Procedures for Genuine Stress Incontinence
 1. Periurethral bulk injections (e.g., polytef, collagen, fat)
 2. Vaginal urethropexy (e.g., bladder neck plication, vaginalparavaginal defect repair)
 3. Retropubic urethropexy (e.g., Marshall-Marchetti-Krantz, Burch, and paravaginal defect repair)
 4. Long needle procedures (e.g., Pereyra, Raz, Stamey, Gittes, Muzsnai)
 5. Sling procedures (e.g., fascia lata, rectus fascia, heterologous materials, vaginal wall)

- a. List the indications, contraindications, and cost.
 - b. Describe the techniques.
 - c. Cite published immediate and long-term success rates as a primary procedure and as a secondary procedure.
 - d. Cite published immediate and long-term success rates for procedures for genuine stress incontinence associated with hypermobility, intrinsic urethral sphincteric deficiency, and a combination of these.
 - e. Describe possible intraoperative complications, their detection, techniques for prevention, and their management.
 - f. Describe possible long-term complications and their management.
 - g. Discuss the quality of the studies which have established success and complication rates.
 - h. Evaluate and manage acute and chronic post-operative urinary retention or voiding dysfunction.
- B. Surgical procedures used to restore urinary continence
1. Continence procedures for overflow incontinence due to anatomic obstruction following continence surgery
 2. Cutting of one or more suspending sutures (early)
 3. Retropubic urethrolisis with or without repeat bladder neck suspension (late)
 4. Revision, removal, or release of a suburethral sling
 5. Placement of an artificial urinary sphincter for GSI due to intrinsic urethral sphincteric deficiency
 6. Continent vesicostomy or suprapubic diversion for overflow incontinence due to bladder neck or urethral obstruction
 7. Augmentation cystoplasty, suprapubic diversion, sacral nerve stimulator implantation, and bladder denervation for intractable detrusor instability and decreased bladder compliance
 8. Urethral closure and suprapubic cystostomy for urinary incontinence due to advanced multiple sclerosis
- C. Pharmacological Treatment Drugs Used to Treat Urinary Incontinence
1. Drugs for unstable bladder and urge incontinence (Detrusor overactivity ± urethral instability)
 - a. Detrusor relaxants (anticholinergic agents, spasmolytic agents, calcium channel blockers, prostaglandin inhibitors)
 - b. Urethral pressure stabilizers (α-adrenergic agonists and antagonists)
 - c. Agents with combined detrusor/urethral effects
 - d. Estrogen
 2. Drugs for stress urinary incontinence
 - a. Urethral smooth muscle stimulators (α-adrenergic agonists and β-adrenergic antagonists)
 - b. Estrogen
 3. Drugs to improve emptying and to treat overflow incontinence
 - a. Detrusor stimulators (cholinergic agents, prostaglandins)
 - b. Urethral smooth muscle and bladder outlet relaxants (adrenergic antagonists)
 - c. Urethral skeletal muscle relaxants (polysynaptic inhibitors)
 4. For the pharmacologic agents listed above the fellow should be able to:
 - a. List indications and contraindications.
 - b. Describe the safe and effective ranges of dosing.
 - c. Cite published rates of effectiveness.
 - d. Describe possible side effects and their prevalence.
 - e. List rates of long-term continuation and compliance.
 - f. Evaluate critically the quality of the studies which have established success and complication rates.
 - g. List costs of these drug treatment regimens.
- D. Behavioral Treatment Methods Used to Manage Urinary Incontinence

1. Scheduled voiding regimens (e.g., bladder training, habit training, timed voiding, prompted voiding)
 2. Bladder training with biofeedback (e.g., vesical pressure display)
 3. Pelvic muscle exercises
 4. Pelvic muscle training with biofeedback (e.g., palpation, vaginal pressure display, EMG, vaginal cones)
 5. Electrical stimulation
 6. Treatment of dysfunctional voiding and overflow with biofeedback (e.g., external sphincter EMG display)
- E. Functional Treatment
1. The fellow should understand factors affecting urinary continence. Examples of such factors include:
 - a. Patient related factors such as general debilitation or lack of mobility that result in more time to reach the toilet, limitations in dexterity that result in more time to release clothing, significant voluntary increases in fluid intake, cigarette smoking, or fecal impaction.
 - b. Environmental factors such as a lack of familiarity with facilities, a lack of facilities, or limitations in accessibility of facilities due to a change in living arrangements.
 - c. Concurrent disease factors such as dementia, hyperglycemia, hypercalcemia, infection, age-related nocturnal diuresis, hormonal deprivation, progressive obstructive pulmonary disease, bronchitis and arthritis.
 - d. Medications such as sedatives, hypnotics, loop diuretics, adrenergic agonists/antagonists, antidepressants, calcium channel blockers, other autonomic agents.
 2. The fellow should understand the role and risks of each of the following functional interventions in the management of urinary incontinence and be able to:
 - a. Manage fluid techniques, including evening restrictions.
 - b. Change pharmacologic agents or timing of their use (e.g., timing diuretic use to avoid diuresis at inconvenient times, changing antihypertensive regimens to avoid α -adrenergic blockade).
 - c. Avoid nocturnal diuresis (e.g., daytime rest periods in the reclining position, use of desmopressin).
 - d. Optimize control of allergies, bronchitis, and chronic cough, including the use of nicotine substitutes and the institution of a smoking cessation program.
 - e. Modify the environment to allow easier access to toilet facilities (e.g., use of a bedside commode).
 - f. Optimize bowel function and minimize constipation, straining, or fecal impaction.
 - g. Modify clothing to compensate for decreased dexterity (e.g., Velcro closures instead of buttons).
 - h. Consider therapeutic opportunities that multiple lower urinary tract abnormalities may create (e.g., symptomatic DHIC and asymptomatic GSI coexist in a sedentary elderly patient who is unable to master intermittent self-catheterization and suppress detrusor activity with anticholinergic and teach her to take advantage of her stress incompetent urethra by voiding with Valsalva strain or Credé).
 - i. Use intermittent self-catheterization.
 - j. Use absorbent products.
 - k. Use pessaries or tampons.
 - l. Identify hazards and limitations of chronic indwelling catheters.

APPENDIX 6

Pelvic Organ Prolapse and Pelvic Floor Dysfunction

- A. Take a specific history that will establish symptoms attributable to the prolapse or pelvic floor dysfunction.
- B. Perform a directed physical examination that will identify and accurately describe all anatomic defects, describe the prolapse quantitatively, and stage the prolapse according to the Pelvic Organ Prolapse Quantification (POP-Q) system or to another established grading system.
- C. Select the diagnostic techniques needed to:
 1. Identify the organs and defects involved in the prolapse.
 2. Evaluate co-existing factors or diseases which may have an important bearing on selection of and response to treatment.
- D. Establish the existence, frequency, duration, and severity of functional symptoms which may be attributable to pelvic organ prolapse and pelvic floor dysfunction related to the lower urinary tract, the bowel, sexual activity, and other local symptoms. The fellow should be aware of the lack of established cause and effect relationships between prolapse and various symptoms as well as the frequent disparity between anatomic findings and clinical symptoms.
- E. Characterize lower urinary tract symptoms. Reference has already been made to currently approved ICS terminology related to lower urinary tract function. In addition, fellows should be able to assess important prolapse-related symptoms not included in the current standards (e.g., the need to reduce manually the prolapse or assume an unusual position to initiate or complete micturition, feelings of incomplete emptying, weak or prolonged urinary stream).
- F. Characterize bowel symptoms. Fecal incontinence will be discussed in detail. Fellows should be able to assess other bowel symptoms that may be attributable to prolapse or pelvic floor dysfunction (e.g., difficulty with defecation, discomfort with defecation, digital manipulation of the vagina or perineum to complete defecation, or a feeling of incomplete evacuation).
- G. Characterize sexual function symptoms. Fellows should understand the difficulty of distinguishing between the ability to have vaginal intercourse and satisfactory sexual function. This history should include an assessment of the degree of sexual activity, reasons for diminished activity, satisfaction with sexual activity, and changes in activity.
- H. Characterize pelvic symptoms possibly resulting from pelvic organ prolapse and pelvic floor dysfunction. Fellows should recognize the current lack of knowledge regarding the precise nature of symptoms that may be caused by the presence of a protrusion or bulge.
- I. Elicit a complete list of all prior therapies (including selfadministered management techniques) and the response to each.
- J. Perform a directed physical examination and be able to:
 1. Perform and correctly interpret a directed neurologic examination including an assessment of voluntary muscle control, pelvic floor reflexes, and sensory function.
 2. Perform a site-specific examination and construct a precise quantitative description of the individual patient's pelvic support and anatomy according to the Pelvic Organ Prolapse Quantification (POP-Q) system or other standardized systems.
 3. Understand the many variables of the conditions of the examination that may affect the severity of the observed prolapse and alter the measurements.
 4. Assign an appropriate stage or grade to the prolapse based upon the site-specific examination.
 5. Perform ancillary procedures that may further characterize an individual patient's pelvic organ prolapse (e.g., urethral axial mobility measurements, measurements of perineal descent, techniques for differentiating central versus anterior paravaginal defects, techniques for differentiating types of enteroceles).
- K. Perform diagnostic techniques, and for each of the diagnostic techniques or tests listed in Table III, the fellow must know the:
 1. Accepted standard terminology, normal values and reliability of the test.
 2. Variations in instruments and techniques for performing the test.

3. Requisite technical specifications of equipment or systems necessary to measure pertinent variables or visualize pertinent structures.
 4. Indications for, limitations of and cost-effectiveness of the test.
 5. Difference between static and dynamic use of the test, including the value of performing the study in different positions.
 6. Significant controversies regarding the interpretation or usefulness of the test.
 7. Results which mandate further testing.
- L. Diagnostic Tests for Pelvic Organ Prolapse
1. Photography
 2. Endoscopy including cystourethroscopy, anoscopy and proctography
 3. Imaging studies including ultrasonography, contrast radiography, computed tomography, MRI
 4. Pelvic floor manometry
 5. Electromyography and neurophysiologic testing
 6. Urodynamic studies with and without the prolapse reduced

APPENDIX 7

Fecal Incontinence (FI)

- A. Take a history that will establish the clinical types and severity of the FI.
- B. Perform a directed physical examination that will be correlated with the results of objective testing to formulate a treatment plan.
- C. Select the diagnostic techniques needed to:
 1. Establish the cause of the FI.
 2. Evaluate co-existing factors or diseases which may have an important bearing on selection and response to treatment.
- D. Obtain a specific history and must be able to:
 1. Understand the associative or alternative presenting complaints of patients with fecal incontinence including diarrhea, rectal urgency or defecatory problems, and the association of FI and urinary incontinence.
 2. Elicit a history that differentiates the involuntary passage of flatus, unformed stool and formed stool, the leaking of relatively small amounts of non-fecal liquid material staining underclothes, and bothersome frequent or urgent defecation not associated with actual soiling.
 3. Establish the severity and duration of the fecal incontinence and the factors which contribute or precipitate it. This must include an assessment of the degree to which the patient has restricted or otherwise altered her normal activity because of FI.
 4. Evaluate past medical, obstetrical and surgical histories as they relate to the current symptoms
 5. Evaluate current medications including over the counter drugs and their possible effect on ano-rectal function.
 6. Evaluate the status of other organ systems including neurologic, lower urinary tract and pelvic support, and their possible effects on the colorectal system.
 7. Understand the possible psychosocial and psychosexual effects of defecatory dysfunction
 8. Elicit a complete list of all prior therapies (including self administered management techniques) and the response to each.
- B. Perform a directed physical examination and be able to:
 1. Perform and correctly interpret a directed neurologic examination including assessment of voluntary muscle control, pelvic floor reflexes, and perineal and ano-rectal sensory function.
 2. Inspect the lower vagina, perineal body, and external anal sphincter to detect abnormalities including fistula, fissures, scarring, attenuation and/or descent of the perineum, rectal prolapse, hemorrhoids and discrete sphincter defects. Because

there are often multiple defects, the importance of a complete and systemic examination must be understood.

3. Perform and correctly interpret the anatomic and neurologic findings of vaginal and rectal examinations under different conditions in order to detect signs associated with defecatory dysfunction.
- C. Perform diagnostic techniques listed in below; and for each of the diagnostic techniques or tests listed, the fellow must know the:
1. Accepted standard terminology, normal values and reliability of the test.
 2. Variations in instruments and techniques for performing the test.
 3. Requisite technical specifications of equipment or systems necessary to measure pertinent variables or visualize pertinent structures.
 4. Indications for, limitations of and cost-effectiveness of the test.
 5. Difference between static and dynamic use of the test, including the value of performing the study in different positions.
 6. Significant controversies regarding the interpretation or usefulness of the test.
 7. Results which mandate further testing.
- D. Diagnostic Tests for Fecal Incontinence
1. Endoscopy including anoscopy, proctoscopy, and colonoscopy
 2. Anal manometry
 3. Anal vector manometry
 4. Anorectal sensory assessment
 5. Measurement of rectal compliance
 6. Defecography or evacuation proctography
 7. Neurophysiologic studies (e.g., electromyography, motor unit potential analysis, terminal motor latencies, cauda equina stimulation, single fiber EMG)
 8. Anal endosonography
 9. Other imaging techniques including dynamic fluoroscopy, anal sphincter MRI, fistulography, and traditional bowel imaging studies

APPENDIX 8

Rectovaginal Fistula

- A. Take a comprehensive history and be able to perform a physical examination of the pelvis.
- B. Describe the etiology of rectovaginal fistula formation due to the following etiologies:
 1. Congenital
 2. Obstetric
 3. Trauma
 4. Radiation
 5. Inflammatory bowel disease
 6. Primary, recurrent or metastatic neoplastic disease
 7. Miscellaneous
- C. Select the appropriate diagnostic studies necessary to establish the diagnosis.
- D. Perform the precise operative repair which will vary with location, size, number and etiology of the rectovaginal fistula.
- E. Provide appropriate postoperative care and management of complications.

APPENDIX 9

Neurogenic Bladder

- A. Take a history that defines the neurogenic condition as to type, extent and gross motor and sensory deficits;
- B. Perform an accurate physical examination, including a neurologic examination, which includes an assessment of perineal sensation, levator muscle function and anal sphincter function;
- C. Use the appropriate studies and diagnostic steps to define bladder storage and voiding function and assess the risk of lower urinary tract dysfunction to renal and ureteral integrity. This includes the assessment of bladder compliance, the determination of voiding efficiency and radiographic and ultrasonographic assessment, and perfusion testing of the ureter.
- D. Describe the risks incurred by persons with neurogenic conditions affecting lower urinary traction function including:
 1. Sepsis,
 2. Stone formation,
 3. Ureteral dysfunction or failure,
 4. Renal insufficiency,
 5. Incontinence,
 6. Skin breakdown,
 7. Sexual dysfunction,
 8. Urethral dysfunction,
 9. Urethral erosion,
 10. Osteomyelitis,
 11. Dystrophic calcification
- E. Understand the pathophysiology of the conditions listed in D1-11, above.
- F. Formulate a management plan which protects the upper urinary tract from neurogenic bladder dysfunction, including
 1. Implementation of intermittent catheterization,
 2. Drug therapy of detrusor overactivity and abnormal compliance,
 3. Procedures to enlarge the bladder such as:
 - a. Auto-augmentation, and
 - b. Augmentation cystoplasty.
 4. Construction of a continent neo urethra:
 5. Closure of a non-functional urethra by transection, and
 6. Closure or a sling-type procedure.
- G. Understand the pathophysiology and management of autonomic dysreflexia
- H. Recognize lower urinary symptoms and dysfunction related to multiple sclerosis, including:
 1. Simple motor urge incontinence,
 2. Chronic urinary retention,
 3. Detrusor sphincter dyssynergia.