

# ADVANCES IN UROLOGY



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## Improving Surgical Approaches in Urogynecology

“Urogynecology is an extraordinary medical field, as we get to help women who would otherwise suffer from conditions that can essentially ruin their quality of life,” says **Patrick J. Culligan, MD**, Director of Urogynecology at the recently established Center for Female Pelvic Health in the Department of Urology at NewYork-Presbyterian/Weill Cornell Medical Center. A nationally recognized leader in urogynecology and advanced minimally invasive reconstructive surgeries, Dr. Culligan provides care for women who have suffered for years – and often silently – with discomforting pelvic conditions, including pelvic organ prolapse.

“Astonishingly, women typically live with organ prolapse for five or 10 years before seeing a physician,” says Dr. Culligan, who previously served as Director of the Division of Urogynecology and Reconstructive Pelvic Surgery for the Atlantic Health System. “This field exists to focus on the surgical and nonsurgical therapies that actually work for them.”



*Dr. Patrick J. Culligan*

At Atlantic Health, Dr. Culligan created a board-approved fellowship program and published over 50 peer-reviewed articles on clinical research focused on ways to improve and teach minimally

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## Reconstructive Urology: Helping to Restore Quality of Life

As one of the country’s leading experts in adult reconstructive urology, **Steven B. Brandes, MD**, cares for patients with the most complex conditions and disorders of the genitourinary system. Dr. Brandes joined NewYork-Presbyterian/Columbia University Medical Center in February 2016 as Director of the new Division of Reconstructive Urologic Surgery in the Department of Urology. This comprehensive program, in collaboration with Gynecologic Oncology, Colorectal Surgery, and Plastic Surgery, addresses the myriad issues related to surgically restoring

lower urinary tract and genital form and function. The program’s faculty provide unique expertise in improving quality of life and restoring urination and kidney and sexual function for patients who suffer from the complications of radiation therapy, iatrogenic injuries from cancer surgery, traumatic injuries (such as pelvic fracture), or who have congenital anomalies of the kidney or urinary tract.

“Our multidisciplinary reconstructive urology program is very unique. There is only a handful of other such programs in the entire country, and we are one of only two in the Tri-state area,” says Dr. Brandes. “We see patients with highly complex problems. Most patients are referred by urologists or colorectal surgeons due to complications or sequela of a previous surgery or treatment. This is a very limited and select population of highly challenging patients, many who have failed prior attempts at surgical repair.”

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**“We welcome complex patients. There’s no case too complicated or too large. And by the same token, there’s also no case too simple. We see patients with all stages of conditions.”**

— Dr. Steven B. Brandes



**NewYork-Presbyterian Urology ranks #6 in the nation.**

## Improving Surgical Approaches in Urogynecology (continued from page 1)

invasive surgical techniques for the correction of prolapse and incontinence. While there he also developed particular expertise in robotic-assisted laparoscopic surgery and has become a world-renowned teacher of those techniques.

“Our philosophy at Weill Cornell’s Center for Female Pelvic Health is to understand each patient’s personal goals and what is interfering in their quality of life. We then develop a nonsurgical and a surgical plan and let the patient decide. That’s a key point,” says Dr. Culligan. “Many women start out nonsurgically and then ultimately choose surgery, and some are satisfied with their nonsurgical plan.”

Vaginal surgery, notes Dr. Culligan, is the classic minimally invasive surgery, utilizing no abdominal incisions. “We perform vaginal hysterectomy and vaginal reconstruction; it’s the original, natural orifice surgery.” With vaginal surgery, the patient’s own native tissue is typically used in the reconstruction.

“The problem with native tissue surgery is that the surgery is only as good as the patient’s tissue,” says Dr. Culligan. “The failure rate with vaginal surgery is going to be high – about 30 percent. The other part of that story is that women often live with their pelvic organ prolapse for years before they do anything about it. When you do a surgery after all of that and then it fails within a year or two, it’s very discouraging for the patient.”

### The Success of Robotic Sacrocolpopexy

Sacrocolpopexy for repairing pelvic organ prolapse has been performed since 1962 and for years this procedure of “last resort” was an open surgery. Dr. Culligan became one of the first urogynecologists in the country to regularly perform laparoscopic sacrocolpopexy; he then transitioned to robotic sacrocolpopexy. During this time, the evolution of mesh material for the procedure had improved. “We use polypropylene mesh that is very lightweight,” says Dr. Culligan. “It’s strong enough to hold the tissue in place and allow the patient’s own tissue to grow into the graft itself and create the strength that is necessary without the mesh complications.”

Dr. Culligan has developed a technique for placing the mesh along the entire length of the anterior and posterior vaginal walls. “This is so I can reconstruct the vagina and basically re-conform it to a natural and normal size and shape after prolapse and not have to do anything vaginally,” he says.

Dr. Culligan also specializes in mesh removal. “Patients come from all over to have their mesh removed when necessary,” he says. “It’s a challenging surgery, but it is also very gratifying. It can be a quick fix for people who have been in a lot of pain from the mesh. Oddly enough, when it is taken out, the healing process keeps everything where it belongs and we don’t have to replace it.”

Dr. Culligan has done extensive research on robotic sacrocolpopexy. With long-term patient follow-up greater than five years, he has an extremely good, long-term success rate, both objectively and subjectively. “It’s having a hybrid end point,” says Dr. Culligan. “We’re not just looking at an objective, anatomic outcome, but also subjective – do the patients feel they have met their goals and are they happy with the results.”

Many surgeons perform part of the surgery robotically and then perform additional surgery vaginally, says Dr. Culligan. “This turns into a long ordeal. The techniques that I’ve developed, and have trained others in, are to accomplish everything with the robot.”

To that end, Dr. Culligan published the first robotic simulator protocol as a way to provide board-certified laparoscopic surgeons with robotic surgical skills without learning on live patients. After taking the course, the surgeons were able to perform a robotic hysterectomy at expert levels. “There was no significant difference between the experts doing benchmark hysterectomies versus the novice’s doing their very first robotic hysterectomy,” says Dr. Culligan, who is presently exploring if the protocol can be applied to resident training. “That’s predictive validity, which is the Holy Grail of validity studies. A number of health systems around the country have since adopted this protocol.”

### Prolapse Surgery Failure: A Genetic Cause?

Dr. Culligan’s research pursuits include investigating a genetic mutation that may cause prolapse surgery failure. For more than 10 years studying a large number of patient cases, Dr. Culligan noticed a handful of patients whose surgery failed early on and in an unusual clinical way. “That made me think that it wasn’t the surgical technique or that the sutures were faulty. Ultimately, I asked these patients to be in a research study and provide me with their full genetic information.”

Dr. Culligan compared a random selection of successful cases from his database and asked those patients for their genetic information as well. “It was, essentially, a fishing expedition looking for a genetic mutation that would make sense – something that could explain the failures. We found a mutation on a gene on chromosome 5 that existed among the patients that I selected as unusual clinical failures and that was not present in any of the controls. We then compared two very large databases of patients with similar demographics. This has been the first step. The next step is verification, which will be a longer process, but it could be very exciting.”

Recently the Center for Female Pelvic Health welcomed urogynecologist **Tanaka J. Dune, MD**. “Dr. Dune is excellently trained, and in this field that is devoted to women, it’s great to have a female perspective,” says Dr. Culligan.

The Center continues to grow and has incorporated physical therapists. In addition, Dr. Culligan and his Weill Cornell colleagues are in the process of establishing a board-certified three-year fellowship in female pelvic medicine and reconstructive surgery in collaboration with colorectal specialists, gastroenterologists, and urologists.

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## Reconstructive Urology: Helping to Restore Quality of Life *(continued from page 1)*



*Dr. Steven B. Brandes*

Patients will also often self-refer because they are frustrated with their poor quality of life. Because of the highly specialized team approach to surgical reconstruction, patients are often referred to Columbia Reconstructive Urology from states across the eastern seaboard, from Florida to New England. “We are not just a regional, but an east coast referral center for complex GU reconstruction,” adds Dr. Brandes.

Prior to joining Columbia, Dr. Brandes was Director of the Section of Reconstructive Urology at Barnes-Jewish Hospital in St. Louis and Professor of Urologic Surgery at Washington University School of Medicine. He also served as the Director of both Washington University’s Urology Residency Program and its Reconstructive Urology Fellowship. Earlier in his career, Dr. Brandes was Chief of Urology at the St. Louis Veteran Affairs Medical Center.

A strong advocate for multidisciplinary approaches to urologic care, Dr. Brandes adheres to a holistic care methodology that seeks to maintain not only the best possible urinary and kidney function, but also addresses issues of fertility, sexuality, and independent living. He and his team have extensive experience in urethral stricture surgery (urethroplasty), neo-bladder and bladder neck reconstruction, management of the neurogenic bowel and bladder, long-term surgical management of catheterizable pouch and stoma problems, male incontinence and erectile dysfunction, the hypospadias ‘cripple,’ as well as functional and cosmetic issues of the vagina and penis, and the ability to have children. They also have extensive experience with prosthetic surgery for urinary incontinence and erectile dysfunction. A complete reconstructive urology team has been assembled with three urologists, a urology fellow, and a nurse practitioner: **Peter J. Stahl, MD**, erectile dysfunction and infertility; **Doreen E. Chung, MD**, pelvic floor reconstruction; **Shumyle Alam, MD**, pediatric reconstruction; **Robert A. Goldfarb, MD**, clinical fellow; and **Laura Ruffo, NP**, advanced practice nurse practitioner.

“We don’t do our reconstructive surgeries in a vacuum,” says Dr. Brandes. “So many of our patients have to be treated in tandem with colleagues in other specialties. We involve plastic surgery to help us with the muscle flaps for flap reconstruction. We also involve colorectal surgery because there is frequently communication between the bowels and the bladder or the upper urinary tract. Furthermore, we work with our GYN colleagues as well for patients

with cervical cancer who undergo high dose radiation and develop stenoses, fistulas, or contractures of the ureters or bladder. We also recently added a stress support program for our patients with psychologists to help patients cope with the stress and anxiety of their poor quality of life before we get to fix them.”

The Columbia Urology clinical reconstruction program primarily focuses on urologic cancer survivorship. “Reconstructive urology involves managing complications of post-oncologic radiation therapy and surgery; one to five percent of patients have severe complications,” says Dr. Brandes. “Our goal is to replicate normal function or return patients back to normal functioning, whether for urination, sexual function, or to achieve normal looking and functioning genitalia.”

The cancer survivorship program addresses not only issues of urinary and fecal control, but also erectile dysfunction and vaginal reconstruction. “These are issues that should be discussed even before patients undergo treatment and addressed afterward in a coordinated plan,” he says. “The end point is not just being alive, but quality of life. Being alive post-treatment or post-surgery with no quality of life is not a win. Quality of life is just as important, if not more important, than just quantity.”

### Transition Urology: Facilitating Care from Childhood to Adulthood

Dr. Brandes also has a particular interest in transition urology and urologic congenitalism. “Patients who are born with congenital anomalies of the genitourinary system and kidney typically undergo complex reconstructive surgeries as children. However, these patients are truly never ‘fixed’ and continue to have lifelong maintenance issues and the need for further reconstructive surgeries,” says Dr. Brandes. “They may be well cared for as children at a children’s hospital, but once they reach adulthood, the resources and access to medical care for their complex urologic issues are marginal to non-existent. There really is no safety net for them in the adult world. They often get lost in the fray and end up with major complications.”

Through multidisciplinary care clinics, which include pediatric specialists within urology, Dr. Brandes and his colleagues are providing ongoing care for this vulnerable and underserved population. “I work closely with Shumyle Alam, who is a specialist in pediatric pelvic and urogenital reconstruction at Columbia, to provide continuity of care and ease the transition to adult care,” adds Dr. Brandes. “Having a fulfilling and meaningful life as an adult is much more complicated than just achieving fecal and urinary continence. It also includes the ability to achieve independence, socialization, and the potential for a sexual relationship, procreation, and a family.”

### Pursuing Research and Education

Dr. Brandes, who is the current President of the Society of Genitourinary Reconstructive Surgeons, is the author of more than 100 peer-reviewed publications and book chapters, and has edited two textbooks on urologic reconstructive surgery. At Columbia, he is establishing a basic science laboratory in collaboration with the Cancer Research Center focused on his long-standing interest in regenerative medicine, tissue engineering, and the use of scaffolds for reconstruction of genital organs. He is also continuing clinical research in improving techniques in reconstructive surgery of the genitals and lower urinary tract, urethral stricture surgery, urinary fistula repairs, radiation fistulas, and traumatic urologic injuries.

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**Reconstructive Urology: Helping to Restore Quality of Life** *(continued from page 3)*

Reflecting on future advances in reconstructive urology, Dr. Brandes looks forward to the transplantation of artificial bladders and other organs. “The problem is that urine contains solutes, electrolytes, and chemicals,” he says. “When they come in contact with metal or plastic they cause calcification in the lining of the bladder or ureter that leads to obstruction or infection. So attempts at an artificial bladder or ureter have all failed. I would say it could be at least 10 years before we see anything commercially available.”

In the education realm, Dr. Brandes has been instrumental in the establishment of clinical fellowship in reconstructive urology surgery at Columbia for urologists from across the country who seek additional training and subspecialization. Columbia Urology's first fellow was from the University of Minnesota, and their second fellow starting this summer is from the University of Texas-Houston.

Dr. Brandes was drawn to reconstructive urology because, he says, “This specialty is a crossroads between medicine and surgery, and you can incorporate as much or as little of both into your practice. I wanted to develop long-lasting relationships with my patients. That is very rewarding to me.”

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