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**Laparoscopic Adrenalectomy** 351  
David S. Wang and Toshiro Terashi

Laparoscopic adrenalectomy has become an accepted method for removing benign lesions of the adrenal gland. There are few contraindications to the laparoscopic approach, and the transperitoneal and retroperitoneal techniques yield excellent results. Virtually all benign lesions and select malignant lesions can be removed laparoscopically. Laparoscopic adrenalectomy has been shown to be a safe and effective approach to many forms of adrenal pathologic conditions. It should be considered the standard of care in the management of benign lesions of the adrenal gland that require surgical removal.

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Geoffrey N. Box, Daniel S. Lehman, Jaime Landman, and Ralph V. Clayman

This article focuses on the laparoscopic approaches to radical and partial nephrectomy for the management of renal cell carcinoma and on the laparoscopic and endoscopic approaches for treating upper tract urothelial carcinoma. An in-depth discussion of treatment for transitional cell carcinoma is also presented.

**Laparoscopic Partial Nephrectomy: an Update on Contemporary Issues** 385  
Sero Andonian, Günter Janetschek, and Benjamin R. Lee

Laparoscopic partial nephrectomy (LPN) is a technically challenging procedure with up to 5-year follow-up data. In this article, incidence of renal cell carcinoma, indications, and contraindications for LPN are presented. In addition, LPN for benign diseases such as atrophic renal segments associated with duplicated collecting systems and calyceal diverticula associated with recurrent UTIs are presented. Hilar clamping, ischemic time, positive margins, and port-site metastasis, in addition to complications and survival outcomes, are discussed. The advantages of lower cost, decreased postoperative pain, and early recovery have to be balanced with prolonged warm ischemia. Its long-term outcomes in terms of renal insufficiency or hemodialysis requirements have not been defined completely. Randomized clinical trials comparing open partial nephrectomy (OPN) versus LPN are needed.

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<p>Energy targeting is greatly enhanced through imaging modalities, which greatly assist needle placement or energy delivery to the optimal location for maximal effectiveness. When vital structures obscure access to the renal lesion, laparoscopic mobilization of these structures with direct visualization of the tumor can increase the likelihood of ablation success and minimize complication risk. Ablative therapies are attractive because of their minimal impact on patient quality of life in addition to their morbidity and cost. Although they show promise of efficacy, they must be evaluated with long-term follow-up before they are considered the standard of oncologic care. Renal masses can be treated with a laparoscopic or percutaneous approach depending on tumor location, size, and the available technology and experience of the center.</p>	
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<i>Multimedia Components available within this article at <a href="http://www.urologic.theclinics.com">www.urologic.theclinics.com</a></i>	
<p>Since it first was performed in 1995, laparoscopic donor nephrectomy (LDN) has grown to be the standard of care in most transplant centers in the United States. This article reviews the current indications, selection criteria, surgical approaches, outcomes, and complications of LDN.</p>	
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<p>The surgical management of urolithiasis is an ever-changing discipline that presents unique challenges to the urologist. This article reviews the current minimally invasive treatment options for upper urinary tract urolithiasis. First it examines several factors that influence stone-free rates, including Hounsfield units of calculi, obesity, and lower pole factors. Surgical management of ureteral calculi is reviewed along with a discussion of stone management in high-risk patients including those who are pregnant. Surgical technique of shockwave lithotripsy, ureteroscopy, percutaneous nephrolithotomy, and laparoscopy is discussed in depth, with attention paid to possible variations in technique.</p>	
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<p>The application of laparoscopic techniques to radical cystectomy has been a recent and natural evolution of successful laparoscopic applications in renal surgery and prostatectomy. The authors' ongoing international registry comprises over 700 cases from 14 countries. Most laparoscopic radical cystectomy (LRC) operations are performed using standard laparoscopic technique, with a minority of hand-assisted or robotic-assisted</p>	

procedures. This article attempts to provide an overview of the current status of LRC, with technical details, modifications, and results of various techniques as reported by the authors' group and other groups.

### **Minimally Invasive Treatment of Stress Urinary Incontinence and Vaginal Prolapse**

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Elizabeth B. Takacs and Kathleen C. Kobashi

*Multimedia Components available within this article at [www.urologic.theclinics.com](http://www.urologic.theclinics.com)*

Stress urinary incontinence and pelvic organ prolapse are prevalent conditions that can have detrimental effects on a woman's quality of life. Surgically, this has often been approached by means of a transvaginal route. With recent advances in laparoscopic and robotic instrumentation and operating systems, there is increasing interest in minimally invasive techniques for correction of pelvic organ prolapse. In this article, the authors briefly describe the laparoscopic and robotic approaches in terms of surgical techniques, operative anatomy, and results published in the literature.

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Matthew H. Hayn, Marc C. Smaldone, Michael C. Ost, and Steven G. Docimo

Vesicoureteral reflux (VUR) is a common problem in childhood, affecting approximately 1% to 2% of the pediatric population. Mild cases of VUR are likely to resolve spontaneously, but high-grade VUR may require surgical correction. Pediatric urologists are familiar with open antireflux operations, which can be accomplished with minimal operative morbidity. Minimally invasive endoscopic and laparoscopic techniques that now exist may serve to reduce morbidity further. This article reviews the endoscopic materials, techniques, and outcomes in the treatment of VUR in addition to the techniques and outcomes of laparoscopic and robotic ureteroneocystotomy.

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Mark L. Gonzalgo, Nilesh Patil, Li-Ming Su, and Vipul R. Patel

*Multimedia Components available within this article at [www.urologic.theclinics.com](http://www.urologic.theclinics.com)*

For clinically localized prostate cancer, radical prostatectomy remains the "gold standard" treatment. New forms of minimally invasive therapies are sought out by patients, however, because of the potential morbidity associated with open surgery. With quality-of-life aspects influencing patient decision making, minimally invasive therapeutic modalities have generated great interest among patients. Laparoscopic radical prostatectomy, robotic-assisted laparoscopic prostatectomy, brachytherapy, cryotherapy, and high-intensity focused ultrasound are all considered to be minimally invasive treatment options for the management of clinically localized prostate cancer.

### **Minimally Invasive Treatment of Lower Urinary Tract Obstruction**

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Jean J.M.C.H. de la Rosette, Stavros Gravas, and John M. Fitzpatrick

During the past decade, increasing numbers of minimally invasive treatments for managing male lower urinary tract symptoms caused by urinary tract obstruction have been positioned. On one hand, transurethral needle ablation and transurethral microwave thermotherapy bridge the gap between medical management and surgery, while on the other hand, outcomes of holmium laser enucleation of the prostate and Greenlight laser equal outcomes following transurethral resection of the prostate (TURP). With the introduction of the bipolar technology, however, TURP has reinforced its position.

**Simulation and Computer-Animated Devices: The New Minimally Invasive Skills Training Paradigm**

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Robert M. Sweet and Elspeth M. McDougall

*Multimedia Components available within this article at [www.urologic.theclinics.com](http://www.urologic.theclinics.com)*

Complex surgical technologies, restricted resident work hours, and limited case volumes in surgical practice have created new challenges to surgical education. At the same time, maintenance of established skills and development of new skills are becoming increasingly important for surgeons, especially skills related to technically challenging minimally invasive surgical therapies. In addition, minimally invasive therapies are highly dependent on uniquely specialized teams of health care workers. For all of these reasons, simulation is gaining attention in surgical education for the development and refinement of minimally invasive surgical skills and technique. This article summarizes developments and challenges related to simulation in surgical education, especially as it relates to minimally invasive surgical therapies in the field of urology.

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