

Anesthesia for Major Urologic Surgery



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KEYWORDS

- Enhanced recovery • Shared decision making • Surgical approach • Robot assisted
- Laparoscopic • Prostatectomy • Cystectomy • Robotic prostatectomy

KEY POINTS

- Anesthesia for major urology surgery has changed greatly with the advent of laparoscopic and robot-assisted surgical techniques.
- Enhanced recovery pathways are now established in complex major urologic surgery and are reducing lengths of stay and postoperative complications. This model is extremely important to deliver optimal health care from the decision to operate to the return to normal patient function.
- Anesthetic considerations differ between established robotic surgical centers and those still perfecting the older approach (operative times much greater).
- The success of enhanced recovery pathways in urologic surgery depends upon preoperative assessment, preparation and compliance with all the perioperative elements. Attention to detail and fastidious preparation are the keys to successful anesthesia and outcomes in robotic surgery.

PATIENT POPULATION

The mean age for patients undergoing cystectomy is 60 years. This age is typical of the population of men undergoing major urologic surgery. The patients affected are an elderly cohort, usually with multiple significant comorbidities. They often have a malignancy, associated renal dysfunction, and present a challenge to the anesthetist in the perioperative setting.

ENHANCED RECOVERY CARE PATHWAY

Most surgical pathways in the United Kingdom are now based on the principles of enhanced recovery.^{1,2} This care pathway begins when the patient is still at home, before surgery, and does not end until the patient has returned to the presurgery functional status.

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The preassessment process follows and places the emphasis on the shared decision making that underpins this approach to perioperative care. This process covers various generic issues but may also involve individual risk stratification, cardiopulmonary exercise testing, perioperative management of anticoagulants, and assessment of postoperative high dependency requirements. The patient's health status is also optimized by management of anemia, glycemic control, and treatment of hypertension, as well as dietary, weight, and smoking-cessation advice before surgery.

A consultant-led, multidisciplinary decision can be made as to which procedure and approach is required for each patient.

Major urologic surgery has 2 main categories:

- Upper tract surgery: simple or radical nephrectomy, radical nephroureterectomy, nephron-sparing surgery
- Pelvic surgery: radical cystectomy with urinary diversion and radical prostatectomy

The surgical approach to these procedures differs greatly and there has been rapid adoption of minimally invasive surgery in recent years, particularly with the advent of robot-assisted surgery. The procedure as well as the approach therefore influence the anesthetic techniques recommended.

The authors' unit has been a designated cancer center since 2005 and undertakes approximately 300 robotic pelvic cases per year.³ All cystectomies and prostatectomies are now completed robotically, and the unit has been a national leader in enhanced recovery with one of the shortest lengths of stay in the United Kingdom for radical pelvic surgery.

This unit has ceased using intraoperative cell salvage for cystectomies, because the blood transfusion requirement in robotics has been minimal, decreasing length of stay and cost.

Latest advances include the introduction of day-case robotically assisted laparoscopic prostatectomy.

All patients requiring radical cystectomy undergo preoperative cardiopulmonary exercise testing, and this allows risk stratification for the planned level of dependency in the postoperative period. The high-dependency setting is only used in those patients identified as high risk.

Most radical nephrectomies and nephron-sparing surgery are now performed by laparoscopic or robotically assisted laparoscopic approach. Open renal surgery is reserved for tumors involving the inferior vena cava or large, centrally placed tumors requiring partial nephrectomy for which a laparoscopic approach is not feasible.

SPECIFIC ANESTHETIC CONSIDERATIONS FOR OPEN PROCEDURES

- Blood loss: use of intraoperative cell salvage, transfusion requirements³
- Pain relief: preemptive, intraoperative, and postoperative (multimodal)
- Regional anesthesia: rectus sheath catheters⁴ (placed by the anesthetist using ultrasonography), resulting in earlier mobilization than thoracic epidural anesthesia
- Heat loss: forced-air warmers, fluid warming devices

SPECIFIC CONSIDERATIONS FOR LAPAROSCOPIC PROCEDURES

- Pneumoperitoneum: cardiovascular stability, hypercarbia, postoperative pain
- Potential for concealed bleeding

As with any laparoscopic surgery, issues with ventilation, maintenance of normocapnia, and cardiovascular stability can occur during any urologic procedure involving

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