

## Nursing Care for Patients Undergoing Urologic Surgery: Best Practices

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### Abstract:

Effective nursing care for patients undergoing urologic surgery is crucial in promoting positive outcomes and enhancing recovery. Preoperatively, nurses should conduct thorough assessments to identify any underlying health issues and provide education about the surgical procedure, postoperative expectations, and pain management options. The preparation phase also includes obtaining informed consent, addressing any concerns the patient may have, and ensuring psychological support. Establishing an individualized care plan that incorporates the patient's medical history, allergies, and personal preferences is essential for a tailored approach. Furthermore, implementing protocols for infection prevention, such as appropriate antibiotic administration and surgical site care, can significantly reduce the risk of complications. Postoperative care focuses on monitoring vital signs, wound assessment, and managing complications such as pain, urinary retention, and potential hemorrhage. Nurses should encourage early mobilization and hydration to facilitate recovery and prevent complications like deep vein thrombosis. Education on catheter care, signs of infection, and lifestyle modifications is also vital during the post-surgical period. Supporting the patient emotionally and providing resources for ongoing care can enhance their recovery experience. By adhering to best practices in nursing care, healthcare providers can optimize outcomes for patients undergoing urologic surgery, fostering a safe and supportive environment throughout the surgical process.

**Keywords:** Urologic surgery, nursing care, preoperative assessment, informed consent, pain management, infection prevention, postoperative monitoring, catheter care, patient education, recovery, complications.

### Introduction:

Urologic surgery encompasses a diverse array of procedures aimed at addressing conditions affecting the urinary tract and male reproductive organs. These surgeries can range from minimally invasive techniques, such as laparoscopic nephrectomy, to more complex interventions like radical cystectomy. Given the intricacies and variations in surgical procedures, patients undergoing urologic surgery often present unique challenges and requirements that necessitate tailored nursing care strategies. Effective nursing care is paramount not only for

optimizing surgical outcomes but also for enhancing patient experiences and satisfaction. This research aims to explore best practices in nursing care for patients undergoing urologic surgery, outlining critical components that nurses must consider to foster improved health outcomes and mitigate potential complications [1].

The significance of nursing care in the surgical setting cannot be overstated. Nurses are integral members of the surgical team, often serving as primary caregivers both preoperatively and postoperatively. Their roles encompass

comprehensive assessments, patient education, medication administration, pain management, and holistic support throughout the surgical journey. According to studies, nursing interventions have a direct impact on the patient's recovery trajectory, influencing factors such as surgical site infection rates, length of hospital stay, and overall satisfaction levels. For instance, preoperative education delivered by nurses has demonstrated efficacy in alleviating anxiety and promoting informed consent, which can contribute to better postoperative outcomes. Similarly, postoperative nursing care strategies, including vigilant monitoring for complications and effective pain management protocols, are vital in ensuring a safe recovery process [2].

In the context of urologic surgery, certain patient populations may be particularly vulnerable or at risk for complications. These include older adults, individuals with comorbidities, and those with specific urologic conditions such as prostate cancer or urinary obstruction. Nurses caring for these patients must adopt a comprehensive approach to assess physical, psychosocial, and emotional needs, tailoring interventions accordingly. For example, preoperative assessments may focus on evaluating kidney function, understanding existing coexisting health issues, and preparing the patient for potential changes in bodily functions post-surgery. By prioritizing individualized care, nurses can help to mitigate anxiety, plan for effective rehabilitation, and ensure that patients are adequately informed about their recovery paths [3].

Moreover, an understanding of postoperative complications specific to urologic surgery, such as urinary retention, infection, and bleeding, empowers nurses to implement proactive monitoring and preventive strategies. Essential to this process is the establishment of clear communication channels, both within the healthcare team and with the patients themselves. Collaborative practices involving urologists, nurse practitioners, and nursing staff contribute to a comprehensive care plan, maximizing the patient's postoperative experience and recovery [4].

As the field of urology and surgical care continues to evolve, it is imperative that nursing practices also adapt to incorporate emerging evidence-based guidelines and technological advancements. The integration of telehealth services, for example, has

revolutionized postoperative follow-up, allowing nurses to monitor patients remotely while addressing any concerns they may have in real time. This approach not only enhances access to care but also fosters a supportive recovery environment, emphasizing the continuity of care beyond the hospital or surgical center setting [5].

This research will leverage current literature to delineate best practices in nursing care for patients undergoing urologic surgery. A review of guidelines and protocols established by professional nursing organizations, as well as emerging research focusing on innovative interventions and strategies, will provide a comprehensive foundation for this study. By identifying and discussing these best practices, this research aims to contribute to the ongoing educational needs of nursing professionals, ultimately enhancing the quality of care provided to this unique patient population [6].

### **Preoperative Assessment and Patient Education:**

The preoperative phase is a critical component of patient care, particularly in the field of urology, where surgical interventions are often necessary due to a variety of conditions. Urological surgeries can range from minimally invasive procedures, such as laparoscopic surgeries, to more complex interventions like nephrectomies and prostatectomies. Given the intricate nature of these procedures and the variability in patient conditions, a thorough preoperative evaluation and education are essential for optimizing patient outcomes and minimizing complications [7].

The preoperative evaluation begins with a comprehensive assessment of the patient's medical history. Urology patients may have diverse backgrounds, ailments, and concomitant medical issues, including hypertension, diabetes, cardiovascular diseases, and respiratory problems. As urological surgeries can affect different organ systems, it is essential to uncover any potential risk factors that could complicate the surgery or recovery. The evaluation should also include a review of previous surgeries, allergies, and family histories, allowing clinicians to devise an individualized surgical plan [8].

A focused physical examination is pivotal to assess factors such as vital signs, general health status, and specific urological concerns. Preoperative testing like blood tests, imaging studies, and urinary

assessments help delineate the risk for complications and determine the appropriate surgical approach. For instance, imaging studies may reveal anatomical anomalies, while laboratory tests can highlight renal function and electrolyte balance. Such evaluations allow for early identification of potential pitfalls prior to the day of surgery [9].

Urological surgeries, depending on their complexity, often require anesthesia. An anesthesiologist performs an additional layer of evaluation to assess the patient's suitability for anesthesia, including potential airway complications and pre-existing conditions affecting anesthesia management. The anesthetic plan is a key consideration in the overall preoperative evaluation since it directly influences both intraoperative experiences and postoperative recovery [10].

### **Importance of Preoperative Education**

The education of urology patients before surgery plays a vital role in enhancing overall patient care and satisfaction. It ensures that patients are informed about the procedure, potential risks, and the recovery process [11].

Effective preoperative education empowers patients by fostering a sense of control over their health and treatment. When patients understand the upcoming procedures, they are likely to exhibit increased cooperation, adhere to preoperative instructions, and engage positively with healthcare providers. This empowerment can significantly reduce anxiety levels and improve overall surgical experiences [12].

### **Clarifying Expectations and Outcomes**

One of the critical aspects of preoperative education is setting realistic expectations about the outcomes of urological procedures. Patients may have apprehensions regarding pain, recovery time, and the potential for complications. Educating patients about the typical trajectory of recovery and what they can expect postoperatively ensures that they are mentally prepared. Clarity about postoperative care, activity restrictions, and follow-up appointments plays an essential role in ensuring that patients are informed participants in their recovery process [13].

### **Discussing Risks and Benefits**

Preoperative education also entails a discussion of the risks and benefits associated with the proposed surgical intervention. Informed consent is a legal and ethical requirement of surgical practice, and clear communication about what the surgery entails is vital. Patients should understand the common risks associated with the procedure, such as bleeding, infection, and complications specific to urological surgeries, like urinary incontinence or sexual dysfunction. Discussing potential benefits, including symptom relief and improved quality of life, can help patients weigh their options and make informed decisions regarding their care [14].

### **Strategies for Effective Preoperative Education**

Multiple strategies can enhance the efficacy of preoperative education for urology patients:

#### **Written Materials and Visual Aids**

Supplementing verbal communication with written materials and visual aids can reinforce patient understanding. Brochures, pamphlets, and diagrams can provide valuable visual references that clarify complex information. Many medical facilities now utilize multimedia education tools, including videos that explain procedures, showcasing instrumentation, and focusing on the surgical environment. These resources can supplement in-person discussions [15].

#### **One-on-One Discussions**

Individual consultations between healthcare providers and patients are invaluable in addressing specific concerns and fostering open communication. Healthcare providers should encourage patients to ask questions and express their fears, allowing for a tailored approach to education. Attending family members or caregivers in these discussions can also enhance comprehension and support, as they can provide additional emotional reassurance during the surgical journey [16].

#### **Use of Technology**

With the advances in technology, telemedicine has gained traction, allowing preoperative assessments and education to occur remotely. This modality offers patients the convenience of receiving crucial information without the need to visit the clinic physically. Moreover, online patient portals can enable easy access to educational materials, preoperative checklists, and appointment

scheduling, thereby enhancing overall engagement [17].

### **Preoperative Workshops**

Some healthcare institutions have introduced preoperative workshops where groups of patients undergoing similar procedures receive education together. These workshops facilitate peer support and discussion, empowering patients to share experiences and concerns. Interactive sessions lead to greater retention of information and provide an opportunity for patients to clarify doubts in a supportive environment [17].

### **Informed Consent and Ethical Considerations:**

In the evolving landscape of healthcare, informed consent serves as a cornerstone of ethical medical practice, underscoring the necessity of patient autonomy and shared decision-making. Within the specialty of urology, where patients frequently face highly sensitive issues—ranging from prostate health to infertility—ensuring informed consent is not merely a procedural obligation; it embodies a commitment to respect the dignity and agency of the patient [18].

Informed consent is traditionally defined as the process by which a patient voluntarily agrees to undergo a medical intervention after being fully educated regarding its risks, benefits, alternatives, and potential outcomes. The consolidation of informed consent into medical practice is anchored in ethical principles—primarily the principles of autonomy, beneficence, and non-maleficence. Autonomy emphasizes the patient's right to make decisions about their own body and health; beneficence and non-maleficence mandate that the physician acts in the patient's best interests while avoiding harm [18].

The complexity of informed consent in urology is particularly pronounced because many procedures involve significant emotional and physical repercussions. For instance, a discussion about prostate surgery may encompass not only the technical risks, such as infection and bleeding, but also subjective concerns related to changes in sexual function or urinary continence. Therefore, urologists must navigate a delicate balance that respects the patient's right to make informed choices while also providing empathetic support and guidance [19].

### **Key Aspects of Informed Consent in Urology**

1. **Comprehensive Disclosure:** The informed consent process necessitates comprehensive disclosure of relevant information. Urologists must provide details about the diagnosis, anticipated treatment, including less invasive options, and the potential implications of the treatment on quality of life. For example, men considering treatment options for benign prostatic hyperplasia must understand the risks versus benefits of medications, minimally invasive procedures, and surgical interventions, allowing them to weigh these aspects critically [20].
2. **Assessing Patient Understanding:** It is essential for urologists to confirm that patients grasp the information shared during the consent process. This involves not only delivering information in clear, accessible language but also encouraging questions. Techniques such as the “teach-back” method—where patients are asked to explain back what they have understood—can assess understanding effectively and clarify misconceptions [21].
3. **Cultural Sensitivity:** Urology often deals with issues intertwined with cultural, religious, and personal values—especially regarding male sexual health, reproductive challenges, and intersex conditions. Being culturally sensitive in the consent process is paramount. Urologists must recognize and respect diverse beliefs about health and illness, which may influence a patient's willingness to consent to particular treatments. Addressing these factors can enhance trust and align treatment strategies with the patient's values [22].
4. **Psychological Considerations:** The emotional impact of urologic conditions, such as cancer and erectile dysfunction, can lead to heightened anxiety, depression, and altered self-image. Urologists must be vigilant to psychological factors during the consent process. Referral to mental health support, when appropriate, can facilitate a holistic approach to patient care that

encompasses physical, emotional, and psychological well-being [23].

5. **Capacity and Competence:** Assessing a patient's capacity to provide informed consent is critical, particularly in cases of cognitive impairment or mental health conditions. The healthcare team must ensure that patients can comprehend the information, appreciate the consequences of their choices, and communicate their decisions effectively, taking measures to involve family members or caregivers when necessary [24].

### Ethical Considerations in Urology

The ethical landscape of informed consent in urology also includes broader considerations beyond the individual patient encounter. Among these are:

1. **Informed Consent and Vicarious Decision-Making:** In some cases, patients may delegate decision-making authority to family members or caregivers. Urologists must navigate the ethical implications of surrogate decision-making, ensuring that substitutes fully understand the patient's values and preferences [25].
2. **Capacity to Consent in Vulnerable Populations:** Special attention must be given to vulnerable populations, including minors, individuals with disabilities, and the elderly. Urologists need to adhere to legal standards while also considering ethical imperatives, such as ensuring that vulnerable patients receive appropriate communication and support.
3. **Research and Clinical Trials:** Urology is a field ripe with ongoing research and evolving treatment modalities. When patients are approached for participation in clinical trials, they must be fully informed about the experimental nature of the treatment, potential benefits, and risks involved. The ethical obligation to provide transparent information is heightened in such scenarios, emphasizing the duty to respect patient autonomy and foster informed participation [26].

4. **Disclosure of Conflicts of Interest:** Urologists must also navigate potential conflicts of interest, particularly in scenarios involving proprietary medical devices or interventions. Transparency in disclosing such conflicts is essential in maintaining trust and supporting the ethical underpinning of informed consent [27].

### Best Practices in Infection Prevention and Control:

In the realm of surgical procedures, the prevention of infections remains a critical concern for healthcare providers. Surgical site infections (SSIs) can not only prolong hospital stays and increase healthcare costs but also contribute to significant morbidity and mortality rates among patients. Therefore, implementing best practices in preoperative infection prevention and control (IPC) is essential for optimizing surgical outcomes [28].

The exposure to pathogens before, during, and after a surgical procedure can lead to SSIs, which are primarily caused by bacteria entering the surgical site. The Centers for Disease Control and Prevention (CDC) and other health authorities have identified various risk factors that can increase the likelihood of infection, including diabetes, obesity, smoking, and the length of surgical procedures. Given that SSIs are preventable in many cases, a strong focus on preoperative infection control can significantly enhance patient safety and the overall quality of care [28].

One of the foundational aspects of preoperative infection prevention is a thorough preoperative assessment. This evaluation should include a complete medical history, physical examination, and identification of any comorbid conditions that may predispose the patient to infections. Active screening for nasal carriage of *Staphylococcus aureus*, including methicillin-resistant strains (MRSA), is recommended, particularly for patients undergoing high-risk surgeries. Depending on the findings, appropriate changes in the management plan may be warranted, such as the use of decolonization protocols for carriers [29].

Engaging patients in their own care can have a profound impact on infection prevention. Educating patients about the importance of adhering to preoperative instructions is vital. This education includes the cessation of smoking weeks before

surgery, maintaining good nutrition, and properly managing existing medical conditions, particularly diabetes. Patients should also be informed about the significance of proper hygiene, especially the necessity of showering with antiseptic solutions prior to surgery. When patients understand their role in infection prevention, they are more likely to comply with the measures put in place [30].

The surgical procedure itself is a critical moment in the infection prevention continuum. Surgeons and the operating room team must employ aseptic techniques rigorously. This includes meticulous hand hygiene practices, appropriate use of personal protective equipment (PPE), and ensuring that the surgical site is properly prepared. Surgical teams should adhere to established protocols for skin antisepsis, generally employing an alcohol-based surgical scrub or chlorhexidine gluconate, ensuring thorough antisepsis over the entire area [31].

Furthermore, timing is crucial; the application of antimicrobial agent should occur at least 30 minutes before incision to maximize efficacy. Additionally, the maintenance of normothermia in the patient is vital, as hypothermia can impair immune function and increase the risk of SSIs. Thermal management should be initiated preoperatively, and warm blankets or forced-air warming devices should be utilized throughout the surgical procedure [32].

The administration of prophylactic antibiotics is a widely accepted practice in the prevention of SSIs. Guidelines from organizations such as the CDC and the American College of Surgeons recommend that prophylactic antibiotics be administered within one hour before incision for most surgical procedures. The choice of antibiotic should be tailored based on the type of surgery and the patient's individual risk factors. For instance, in orthopedic surgeries, cephalosporins are commonly used, while anaerobic coverage may be necessary for colorectal procedures. It is equally important to administer the antibiotics within the recommended timeframe to ensure adequate tissue concentrations at the time of incision [33].

The surgical environment must be monitored continuously to prevent the introduction of pathogens. Operating rooms should maintain positive pressure relative to surrounding areas, ensuring that air is filtered and that air exchanges occur frequently. The use of ultraviolet light or other

germicidal methods for disinfection before and after surgeries, along with appropriate sterilization practices for surgical instruments, is critical [34].

Additionally, the involvement of a dedicated infection prevention team is essential for establishing guidelines, conducting regular audits, and ensuring compliance with IPC protocols. This team can also provide ongoing education and training for all staff involved in surgical services [35].

Even after surgery, the role of infection control does not end. Clear postoperative care instructions should be provided to patients, including information on wound care, signs of infection, and the importance of follow-up appointments. Establishing a robust monitoring system for early detection of SSIs can help identify potential infections before they escalate, allowing for prompt intervention [36].

#### **Postoperative Monitoring and Complication Management:**

The field of urology has witnessed significant advancements in surgical techniques and technology, leading to improved patient outcomes. However, despite these advancements, urological surgeries still carry the risk of complications. Postoperative monitoring and management are crucial for minimizing these risks and ensuring optimal recovery [37].

#### **Types of Urological Complications**

Urological surgeries, such as radical prostatectomy, nephrectomy, bladder surgery, and urethral reconstruction, can result in a variety of complications. The nature and severity of these complications can vary widely depending on the type of surgery performed, the patient's medical history, and overall health status [37].

1. **Infection:** Surgical site infections (SSIs) are a common complication following urological surgeries. These can manifest as superficial infections or more serious deep infections involving the organs. Urinary tract infections (UTIs) are particularly prevalent due to catheterization during and after surgery [38].
2. **Hemorrhage:** Postoperative bleeding can occur due to vascular injury during the surgical procedure. This may present as hematuria or as hematomas in the surgical area, necessitating

close monitoring of urinary output and vital signs to identify internal bleeding early.

3. **Urinary Leakage:** One of the more serious complications is urinary leakage from the surgical site. This is especially pertinent in prostate and bladder surgeries and can result in significant morbidity if not managed appropriately. The leakage may lead to increased risk of infection and prolonged recovery [39].
4. **Obstruction:** Ureteral obstruction may arise due to scarring, surgical trauma, or the formation of blood clots. This can present as flank pain or an elevated creatinine level, indicating impairment in renal function.
5. **Nerve Injury:** In procedures involving the prostate or bladder, the risk of nerve injury is a notable concern. This can lead to complications such as erectile dysfunction or urinary incontinence, significantly impacting the patient's quality of life [39].
6. **Thrombosis:** The risk of venous thromboembolism (VTE) increases after major surgeries, including urological operations. Deep vein thrombosis (DVT) may develop, leading to pulmonary embolism if not properly identified and managed [40].

### Importance of Postoperative Monitoring

Postoperative monitoring is essential for the early detection and management of urological complications. Following surgery, patients typically undergo several assessments, including:

- **Vital Signs Monitoring:** Continuous monitoring of blood pressure, heart rate, respiratory rate, and temperature can help identify signs of complications such as infection or hemorrhage[41].
- **Fluid Balance Assessment:** Careful monitoring of fluid intake and output is crucial, particularly to assess for urinary leakage, obstruction, and dehydration. This includes tracking urine color, consistency, and the presence of blood.
- **Laboratory Tests:** Routine blood tests to check hemoglobin levels, kidney function, and infection markers (such as white blood

cell count) can help clinicians detect complications early [41].

- **Physical Examination:** Regular assessment of the surgical site for swelling, redness, or discharge, along with abdominal examinations to check for distension or pain, are vital.

Effective communication among the surgical team, nursing staff, and the patient is imperative during the postoperative period. Patient education is also a key component, with patients being instructed on signs and symptoms to watch for, enhancing self-monitoring and prompt reporting of any issues [42].

### Management Strategies

Once complications are identified, prompt and effective management is essential. The strategies may vary based on the type and severity of the complication:

1. **Infection Management:** Antibiotic therapy may be initiated based on culture results. In the case of deep infections, surgical intervention may be necessary to drain abscesses or debride infected tissues [42].
2. **Managing Bleeding:** The management of hemorrhage may require interventions ranging from conservative management, such as monitoring and supportive care, to more invasive measures, including blood transfusions or reoperation.
3. **Addressing Urinary Leakage:** In cases of urinary leakage, catheterization may be required to bypass the leak and allow for healing. Surgical revision may be necessary in recurrent or severe cases.
4. **Relieving Obstruction:** Ureteral obstruction may necessitate the placement of a ureteral stent or nephrostomy to relieve the obstruction and restore urinary flow [42].
5. **Nerve Injury Interventions:** Comprehensive counseling and supportive care, including pelvic floor physical therapy and pharmacotherapy, are important in managing complications related to nerve injuries.
6. **Preventing Thrombosis:** Prophylactic measures, such as anticoagulant therapy and

early mobilization, are vital to reduce the risk of DVT and associated complications [43].

### **Pain Management Strategies for Optimal Recovery:**

The recovery period following urological surgery can be a challenging experience for patients, often marred by pain and discomfort. Effective pain management is crucial not only for enhancing patient comfort but also for facilitating quicker recovery, reducing the risk of complications, and improving overall outcomes [44].

Urological surgeries, which may involve procedures such as prostatectomies, nephrectomies, or bladder surgeries, can lead to varying degrees of post-operative pain dependent on the nature of the procedure and the individual patient's pain threshold. Acute pain is typically anticipated immediately after surgery, characterized by tissue injury and inflammation. Chronic pain, while less common, can develop in some patients and significantly impact quality of life [45].

Healthcare professionals must assess pain not merely as a symptom to be alleviated but rather as a complex experience influenced by biological, psychological, and social factors. A comprehensive approach to pain management must address these dimensions to ensure that recovery is optimized [46].

### **Pharmacological Pain Management Strategies**

1. **Opioids:** Opioids have been the cornerstone of post-surgical pain relief for decades, providing significant analgesic effects following major urological surgeries. Medications such as morphine and hydromorphone may be utilized, particularly during the immediate post-operative phase. However, due to concerns regarding addiction, tolerance, and side effects such as respiratory depression and constipation, opioids should be prescribed judiciously and for the shortest duration necessary [47].
2. **Nonsteroidal Anti-Inflammatory Drugs (NSAIDs):** NSAIDs, including ibuprofen and ketorolac, can effectively manage pain while minimizing the reliance on opioids. They function by reducing inflammation at the

surgical site. Their incorporation into a multimodal pain management strategy can not only provide effective analgesia but also decrease the overall opioid requirement for patients [47].

3. **Acetaminophen:** Acetaminophen is another non-opioid analgesic often included in pain management regimens. It is typically used in conjunction with NSAIDs or opioids, as it provides an additional mechanism of action for pain relief without significant gastrointestinal or cardiovascular side effects, making it a safer alternative for many patients [48].
4. **Adjunctive Medications:** In some scenarios, adjunct medications such as gabapentinoids (e.g., gabapentin or pregabalin) can be beneficial. These medications target neuropathic pain pathways, which may be relevant for certain urological surgeries that involve nerve manipulation. They are often effective in reducing opioid consumption and enhancing overall pain relief.

### **Non-Pharmacological Pain Management Strategies**

While pharmacological approaches are critical, non-pharmacological strategies play an equally important role in managing post-operative pain and enhancing recovery [49].

1. **Physical Therapy and Early Mobilization:** Encouraging early mobilization post-surgery is essential. Gentle physical therapy can help prevent the stiffness and deconditioning often associated with prolonged bed rest, while also promoting circulation and aiding in pain relief [50].
2. **Mindfulness and Relaxation Techniques:** Psychological interventions, including mindfulness meditation, deep breathing exercises, and guided imagery, have shown promise in alleviating pain. These techniques work by enhancing patients' coping mechanisms and reducing stress and anxiety, which are often exacerbated post-operatively [50].
3. **Cold and Heat Therapy:** Applying cold packs to the surgical site may help alleviate swelling and provide numbness to reduce



pain, particularly in the initial days following surgery. Conversely, heat therapy may be beneficial as recovery progresses, helping to ease muscle tension and improve circulation in the affected areas.

4. **Patient Education and Empowerment:** Providing patients with information about their pain management options, expected recovery trajectories, and the importance of active participation in their care can significantly empower them and enhance their emotional wellbeing during the recovery process [51].

### **Personalized Pain Management Plans**

Recognizing that pain is subjective, a one-size-fits-all approach to pain management is insufficient. A personalized pain management plan should be developed for each patient that considers their unique medical history, individual pain thresholds, co-morbid conditions, and personal preferences. Involving patients in discussions about their pain management options often leads to increased satisfaction and adherence to treatment protocols [52].

Furthermore, healthcare providers must be vigilant in monitoring patient pain levels regularly and adjusting pain management plans as necessary. Utilizing standardized pain assessment tools, such as the Numerical Rating Scale (NRS) or the Faces Pain Scale-Revised (FPS-R), can assist in accurately gauging pain levels and efficacy of management strategies [53].

### **Patient-Centered Care: Addressing Emotional and Psychological Needs:**

In contemporary healthcare, the concept of patient-centered care has emerged as a cornerstone of effective clinical practice. Defined as an approach that tailors medical treatment to the individual needs and preferences of patients, patient-centered care emphasizes the importance of recognizing the emotional and psychological aspects of health, alongside the physical symptoms. This model is particularly significant in urology, a specialty that deals with conditions affecting the urinary tract and male reproductive organs, where patients often face unique emotional and psychological challenges. Addressing these needs is crucial for improving

overall patient outcomes, enhancing quality of life, and fostering a supportive care environment [54].

Urological conditions can range from benign issues, such as urinary tract infections (UTIs) and kidney stones, to more complex diseases, including prostate cancer, bladder cancer, and male infertility. Each of these diagnoses carries its own set of challenges. For example, a diagnosis of prostate cancer not only poses serious physical health threats but can also provoke feelings of anxiety, fear, and uncertainty. Similarly, male infertility can lead to significant emotional distress, impacting intimate relationships and self-esteem [55].

Research has shown that urological patients often experience higher rates of depression and anxiety compared to those with other medical conditions. The sensitivity surrounding issues related to sexual health, urinary function, and reproductive capability can exacerbate stress and lead to feelings of isolation. Consequently, it becomes imperative for urologists and healthcare teams to adopt a holistic approach that encompasses psychological support, aligns treatment with patients' emotional states, and fosters open communication [55].

### **The Components of Patient-Centered Care in Urology**

1. **Effective Communication:** Effective communication is a vital component of patient-centered care. In urology, where diagnoses often pertain to deeply personal and sensitive subjects, establishing a trusting relationship between the patient and healthcare provider is essential. Patients must feel comfortable expressing their concerns, fears, and preferences. Urologists should encourage patients to voice their emotional reactions to diagnoses and treatments, and practitioners should actively listen, validating their concerns and ensuring that their patients feel heard and valued [55].
2. **Empathy and Compassion:** The emotional landscape of urological conditions requires practitioners to embody empathy and compassion. Urologists should be aware of the psychological impacts of conditions and convey a sense of understanding towards the patient's emotional experience. Empathy goes beyond the clinical analysis of symptoms; it involves recognizing a patient's fears and hopes, which

can affirm the patient's dignity and humanity during treatment.

3. **Supportive Resources:** Healthcare providers must incorporate resources for emotional and psychological support into the urologic care model. This could include referrals to mental health professionals, support groups, or counseling services specializing in dealing with chronic illness and sexual health concerns. For instance, a support group for men dealing with prostate cancer can provide a platform for sharing experiences and coping strategies, fostering a sense of community and validation [56].
4. **Integrative Care Approaches:** Integrating other healthcare specialists into the urological care team can enhance the patient-centered approach. This may include psychologists, social workers, or nutritionists who can address the emotional and psychological needs of patients holistically. By providing comprehensive care, patients receive well-rounded support that addresses not only their physical symptoms but also their emotional and psychological well-being [56].
5. **Patient Education:** Education is a critical element in fostering patient-centered care. Urologists should provide clear, comprehensive, and accessible information about diagnoses, treatment options, and potential side effects. This empowers patients to engage actively in their treatment plans and alleviate anxieties stemming from uncertainty. Well-informed patients may feel more in control of their health care, therefore enhancing their overall emotional state [57].
6. **Shared Decision-Making:** Encouraging shared decision-making is pivotal in patient-centered care. Urologists should involve patients in their care journey, discussing treatment options and enabling them to express their values and preferences. This collaborative approach not only increases patient satisfaction but also builds confidence and reassurance, as patients feel invested in their treatment paths [57].

### Challenges and Future Directions

Despite the clear benefits of integrating emotional and psychological support into urological care, several challenges remain. Time constraints in

clinical settings often limit the opportunity for in-depth discussions about emotional needs. Additionally, there exists a societal stigma surrounding issues of sexual health and urological conditions, deterring patients from seeking help or discussing their feelings [58].

To overcome these barriers, healthcare institutions must prioritize training urologists and allied health professionals in communication skills and emotional intelligence. Moreover, integrating mental health screening into routine urological care could facilitate earlier identification of emotional distress and enable timely intervention [58].

The future of patient-centered care in urology lies in a commitment to an empathetic, holistic approach that reflects the understanding of the complexity of patients' experiences. By addressing emotional and psychological needs alongside physical health, healthcare providers pave the way for improved patient outcomes, increased satisfaction, and ultimately, a more comprehensive framework for caring for individuals facing urological challenges [59].

### Discharge Planning and Transition to Home Care:

Discharge planning in the context of urology is a critical process that ensures patients leave the inpatient setting in a safe and efficient manner while also facilitating a seamless transition to home care. The goal of discharge planning is to optimize patient outcomes, prevent readmissions, and enhance the quality of life following surgical or medical interventions within the urological domain. As urological conditions often necessitate specific post-operative care and monitoring, effective discharge planning and transition strategies hold immense significance in patient recovery [60].

### Understanding the Importance of Discharge Planning

Discharge planning is a structured process aimed at preparing patients for a safe transition from the hospital to their home or next care setting. In urology, patients may undergo a range of procedures, from minimally invasive surgeries, such as transurethral resection of the prostate (TURP), to more complex interventions like radical cystectomy or nephrectomy. Each of these procedures carries its own set of post-operative needs, which must be

carefully evaluated during the discharge planning process [61].

Proper discharge planning is crucial for several reasons:

1. **Reduction of Readmissions:** A well-defined discharge plan can significantly lower the likelihood of readmissions. Patients returning to the hospital often suffer additional complications due to inadequate follow-up care or misunderstanding of post-operative instructions [62].
2. **Patient Safety:** The transition from hospital to home increases the risk of adverse events. Discharge planning aims to educate patients about potential complications, warning signs, and self-management techniques to enhance their safety.
3. **Emotional and Psychological Preparedness:** The recovery period after urological surgery can be fraught with anxiety and uncertainty for patients. Providing emotional support and education during discharge helps in alleviating fears about the recovery process.
4. **Resource Utilization:** Effective discharge planning helps streamline healthcare resources and reduces unnecessary costs associated with unplanned hospital visits [62].

### Key Components of Urological Discharge Planning

Successful discharge planning in urology should be comprehensive, individualized, and interprofessional. Several key components are vital to this process:

1. **Comprehensive Assessment:** Prior to discharge, healthcare professionals must conduct a thorough assessment of the patient's medical history, surgical procedure, and potential obstacles to recovery. This assessment informs the development of a tailored discharge plan [63].
2. **Patient Education:** Education is a cornerstone of discharge planning. Patients should receive clear, understandable guidance on medication management, wound care, catheter care (if applicable), dietary restrictions, and activity restrictions. Educational materials may include

written instructions, videos, or demonstrations tailored to the patient's learning preferences.

3. **Medication Reconciliation:** Ensuring that patients understand their medications, including dosages, side effects, and the importance of adherence, is vital. This process involves reconciling the medications taken during hospitalization with the prescriptions that will be continued at home [63].
4. **Follow-Up Appointments:** Scheduling follow-up appointments with urologists or other healthcare providers is essential to monitor the patient's recovery and address any complications early. Providing patients with a clear timeline for follow-up visits supports continuity of care [64].
5. **Coordination of Care:** Collaboration among healthcare team members—including doctors, nurses, social workers, and physical therapists—is essential for an effective discharge plan. Each professional must play a defined role in the process, ensuring that patient care is holistic and well-coordinated.
6. **Support Systems:** Addressing the patient's social and emotional support systems can be pivotal in recovery. For many patients, having family members or caregivers involved in the discharge planning can provide support and ensure adherence to care instructions [64].
7. **Community Resources:** Linking patients with community resources, such as home health services, rehabilitation programs, and support groups, can provide additional assistance during the recovery process. These resources are invaluable for maintaining health and promoting independence as patients transition home [64].

### Challenges in Urology Discharge Planning

Despite the importance of discharge planning, various challenges can complicate the process. Some patients may have comorbid conditions that affect recovery or require additional resources, complicating their transition home. Others might have limited health literacy, making it difficult for them to understand discharge instructions. Furthermore, the availability of community resources can vary widely, depending on geographic

location, which can hinder access to necessary support and care [65].

To counter these challenges, healthcare providers should strive to create a patient-centered approach that emphasizes clear communication, empathy, and advocacy. Utilizing technology, such as telehealth services, can also enhance support for patients during their transition home, particularly for follow-up consultations [66].

### Conclusion:

In conclusion, effective nursing care for patients undergoing urologic surgery is vital for ensuring positive surgical outcomes and promoting overall patient well-being. By emphasizing a comprehensive approach that includes thorough preoperative assessments, informed consent, and meticulous postoperative monitoring, nurses can significantly reduce the risk of complications and enhance the recovery process. Implementing best practices in infection prevention, pain management, and patient education fosters a supportive environment that addresses both the physical and emotional needs of patients. As healthcare continues to evolve, it is essential for nursing professionals to stay informed about the latest evidence-based practices in urologic care. Ultimately, prioritizing patient-centered care not only improves recovery trajectories but also strengthens the nurse-patient relationship, paving the way for improved satisfaction and long-term health outcomes.

### References:

1. Nygren J, Thacker J, Carli F, et al. Guidelines for perioperative care in elective rectal/pelvic surgery: enhanced recovery after surgery (ERAS) Society recommendations. *Clin Nutr.* 2012;31:801–16. doi: 10.1016/j.clnu.2012.08.012.
2. Furlong C. Smoking cessation and its effects on outcomes of surgical interventions.
3. Kurz A, Sessler DI, Lenhardt R. Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. Study of wound infection and temperature group. *N Engl J Med.* 1996;334:1209–15. doi: 10.1056/NEJM199605093341901.
4. Lee CT, Chang SS, Kamat AM, et al. Alvimopan accelerates gastrointestinal recovery after radical cystectomy: a multicenter randomized placebo-controlled trial. *Eur Urol.* 2014;66:265–72. doi: 10.1016/j.eururo.2014.02.036.
5. Smith I, Kranke P, Murat I, et al. Perioperative fasting in adults and children: guidelines from the European Society of Anaesthesiology. *Eur J Anaesthesiol.* 2011;28:556–69. doi: 10.1097/EJA.0b013e3283495ba1.
6. Maffezzini M, Campodonico F, Canepa G, Gerbi G, Parodi D. Current perioperative management of radical cystectomy with intestinal urinary reconstruction for muscle-invasive bladder cancer and reduction of the incidence of postoperative ileus. *Surg Oncol.* 2008;17:41–8. doi: 10.1016/j.suronc.2007.09.003.
7. Hamilton-Reeves JM, Bechtel MD, Hand LK, et al. Effects of Immunonutrition for cystectomy on immune response and infection rates: A pilot randomized controlled clinical trial. *Eur Urol.* 2016;69:389–92. doi: 10.1016/j.eururo.2015.11.019.
8. Cerantola Y, Valerio M, Persson B, et al. Guidelines for perioperative care after radical cystectomy for bladder cancer: Enhanced Recovery After Surgery (ERAS) society recommendations. *Clin Nutr.* 2013;32:879–87. doi: 10.1016/j.clnu.2013.09.014.
9. Lemanu DP, Singh PP, Stowers MD, Hill AG. A systematic review to assess cost effectiveness of enhanced recovery after surgery programs in colorectal surgery. *Colorectal Dis.* 2014;16:338–46. doi: 10.1111/codi.12505.
10. Hashad MM, Atta M, Elabbady A, Elfiky S, Khattab A, Kotb A. Safety of no bowel preparation before ileal urinary diversion. *BJU Int.* 2012;110:E1109–13. doi: 10.1111/j.1464-410X.2012.11415.x.
11. Xu R, Zhao X, Zhong Z, Zhang L. No advantage is gained by preoperative bowel preparation in radical cystectomy and ileal conduit: a randomized controlled trial of 86 patients. *Int Urol Nephrol.* 2010;42:947–50. doi: 10.1007/s11255-010-9732-9.

12. Awad S, Varadhan KK, Ljungqvist O, Lobo DN. A meta-analysis of randomised controlled trials on preoperative oral carbohydrate treatment in elective surgery. *Clin Nutr.* 2013;32:34–44. doi: 10.1016/j.clnu.2012.10.011.
13. Brady M, Kinn S, Stuart P. Preoperative fasting for adults to prevent perioperative complications. *Cochrane Database Syst Rev.* 2003;CD004423. doi: 10.1002/14651858.CD004423.
14. Güenaga KF, Matos D, Wille-Jørgensen P. Mechanical bowel preparation for elective colorectal surgery. *Cochrane Database Syst Rev.* 2011;7:CD001544. doi: 10.1002/14651858.CD001544.
15. Kauf TL, Svatek RS, Amiel G, et al. Alvimopan, a peripherally acting  $\mu$ -opioid receptor antagonist, is associated with reduced costs after radical cystectomy: economic analysis of a phase 4 randomized, controlled trial. *J Urol.* 2014;191:1721–7. doi: 10.1016/j.juro.2013.12.015.
16. Bergqvist D, Agnelli G, Cohen AT, et al. Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer. *N Engl J Med.* 2002;346:975–80. doi: 10.1056/NEJMoa012385.
17. Kondrup J, Rasmussen HH, Hamberg O, Stanga Z Ad Hoc ESPEN Working Group. Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials. *Clin Nutr.* 2003;22:321–36. doi: 10.1016/s0261-5614(02)00214-5.
18. Sachdeva A, Dalton M, Amaragiri SV, Lees T. Elastic compression stockings for prevention of deep vein thrombosis. *Cochrane Database Syst Rev.* 2010;7:CD001484. doi: 10.1002/14651858.CD001484.pub2.
19. Patel HR, Cerantola Y, Valerio M, et al. Enhanced recovery after surgery: are we ready, and can we afford not to implement these pathways for patients undergoing radical cystectomy? *Eur Urol.* 2014;65:263–6. doi: 10.1016/j.eururo.2013.10.011.
20. BAUS. BAUS nephrectomy outcomes data: summary and timescale of the data. 2016b.
21. Cresswell J, Mariappan P, Thomas SA. Radical cystectomy: analysis of trends in UK practice 2004–2012, from the British Association of Urological Surgeons' (BAUS) section of oncology dataset. *J Clin Urol.* 2016;9(1):49–56.
22. Findley GP. Knowing the risk: a review of the peri-operative care of surgical patients. National Confidential Enquiry into Patient Outcome and Death; London. 2011.
23. Hamel MB, Henderson WG, Khuri SF, Daley J. Surgical outcomes for patients aged 80 and older: morbidity and mortality from major noncardiac surgery. *J Am Geriatr Soc.* 2005;53(3):424–429.
24. BAUS. BAUS cystectomy outcomes data: summary & timescale of the data. British Association of Urological Surgeons. 2016a.
25. Older P, Smith R. Experience with the preoperative invasive measurement of haemodynamic, respiratory and renal function in 100 elderly patients scheduled for major abdominal surgery. *Anaesth Intensive Care.* 1988;16(4):389–395.
26. Azhar RA, Bochner B, Catto J, Goh AC, Kelly J, Patel HD, et al. Enhanced recovery after urological surgery: a contemporary systematic review of outcomes, key elements, and research needs. *Eur Urol.* 2016;70(1):176–187.
27. Froessler B, Palm P, Weber I, Hodyl NA, Singh R, Murphy EM. The important role for intravenous iron in perioperative patient blood management in major abdominal surgery: a randomized controlled trial. *Ann Surg.* 2016;264(1):41–46.
28. Mendoza D, Newman RC, Albala D, Cohen MS, Tewari A, Lingeman J, et al. Laparoscopic complications in markedly obese urologic patients (a multi-institutional review). *Urology.* 1996;48(4):562–567.
29. Laird A, Fowler S, Good DW, Stewart GD, Srinivasan V, Cahill D, et al. Contemporary practice and technique-related outcomes for radical prostatectomy in the UK: a report of

- national outcomes. *BJU Int.* 2015;115(5):753–763.
30. García-Miguel FJ, Serrano-Aguilar PG, López-Bastida J. Preoperative assessment. *Lancet.* 2003;362(9397):1749–1757.
31. Koch MO. Robotic versus open prostatectomy: end of the controversy. *J Urol.* 2016;196(1):9–10.
32. Shander A, Van Aken H, Colomina MJ, Gombotz H, Hofmann A, Krauspe R, et al. Patient blood management in Europe. *Br J Anaesth.* 2012;109(1):55–68.
33. The Oxford Levels of Evidence 1. Centre for Evidence-Based Medicine. OCEBM Levels of Evidence Working Group, Oxford Centre for Evidence-Based Medicine. 2009.
34. Mythen M. Perioperative medicine: the pathway to better surgical care. The Royal College of Anaesthetists. 2014.
35. Routine preoperative tests for elective surgery (NICE Guideline NG45). National Institute for Health and Care Excellence. 2016.
36. Bridgewater B. Patient-facing data is essential in the digital era: as surgeons we must take responsibility for our patients, and for our outcomes. *The Bulletin of the Royal College of Surgeons of England.* 2015;97(4):160–163.
37. Fleisher LA, Beckman JA, Brown KA, Calkins H, Chaikof EL, Fleischmann KE, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2007;50(17):e159–e242.
38. Pillai P, McEleavy I, Gaughan M, Snowden C, Nesbitt I, Durkan G, et al. A double-blind randomized controlled clinical trial to assess the effect of Doppler optimized intraoperative fluid management on outcome following radical cystectomy. *J Urol.* 2011;186(6):2201–2206.
39. British Association of Urological Surgeons. BAUS radical prostatectomy outcomes data: summary and timescale of the data. 2016.
40. Pillai P, McEleavy I, Gaughan M, et al. A double-blind randomized controlled clinical trial to assess the effect of Doppler optimized intraoperative fluid management on outcome following radical cystectomy. *J Urol.* 2011;186:2201–6.
41. Giglio MT, Marucci M, Testini M, Brienza N. Goal-directed hemodynamic therapy and gastrointestinal complications in major surgery: a meta-analysis of randomized controlled trials. *Br J Anaesth.* 2009;103:637–46.
42. Donat SM, Slaton JW, Pisters LL, Swanson DA. Early nasogastric tube removal combined with metoclopramide after radical cystectomy and urinary diversion. *J Urol.* 1999;162:1599–602.
43. Roth B, Birkhäuser FD, Zehnder P, Burkhard FC, Thalmann GN, Studer UE. Readaptation of the peritoneum following extended pelvic lymphadenectomy and cystectomy has a significant beneficial impact on early postoperative recovery and complications: results of a prospective randomized trial. *Euro Urol.* 2011;59:204–10.
44. Wuethrich PY, Studer UE, Thalmann GN, Burkhard FC. Intraoperative continuous norepinephrine infusion combined with restrictive deferred hydration significantly reduces the need for blood transfusion in patients undergoing open radical cystectomy: results of a prospective randomized trial. *Eur Urol.* 2014;66:352–60.
45. Nix J, Smith A, Kurpad R, Nielsen ME, Wallen EM, Pruthi RS. Prospective randomized controlled trial of robotic versus open radical cystectomy for bladder cancer: perioperative and pathologic results. *Eur Urol.* 2010;57:196–201.
46. Novara G, Catto JW, Wilson T, et al. Systematic review and cumulative analysis of perioperative outcomes and complications after robot-assisted radical cystectomy. *Eur Urol.* 2015;67:376–401.
47. Hirose Y, Naiki T, Ando R, et al. Novel closing method using subcutaneous continuous drain for preventing surgical site infections in radical cystectomy. *ISRN Urol.* 2014;2014:897451.

48. Mattei A, Birkhaeuser FD, Baermann C, Warnecke SH, Studer UE. To stent or not to stent perioperatively the ureteroileal anastomosis of ileal orthotopic bladder substitutes and ileal conduits? Results of a prospective randomized trial. *J Urol*. 2008;179:582–6.
49. Bundgaard-Nielsen M, Secher NH, Kehlet H. “Liberal” vs. “restrictive” perioperative fluid therapy--a critical assessment of the evidence. *Acta Anaesthesiol Scand*. 2009;53:843–51.
50. Xu W, Daneshmand S, Bazargani ST, et al. Postoperative pain management after radical cystectomy: comparing traditional versus enhanced recovery protocol pathway. *J Urol*. 2015;194:1209–13.
51. Klein S, Kinney J, Jeejeebhoy K, et al. Nutrition support in clinical practice: review of published data and recommendations for future research directions. Summary of a Conference Sponsored by the National Institutes of Health, American Society for Parenteral and Enteral Nutrition, and American Society for Clinical Nutrition. *Am J Clin Nutr*. 1997;66:683–706.
52. Fitzgerald JE, Ahmed I. Systematic review and meta-analysis of chewing-gum therapy in the reduction of postoperative paralytic ileus following gastrointestinal surgery. *World J Surg*. 2009;33:2557–66.
53. López-Olaondo L, Carrascosa F, Pueyo FJ, Monedero P, Busto N, Sáez A. Combination of ondansetron and dexamethasone in the prophylaxis of postoperative nausea and vomiting. *Br J Anaesth*. 1996;76:835–40.
54. Mukhtar S, Ayres BE, Issa R, Swinn MJ, Perry MJ. Challenging boundaries: an enhanced recovery program for radical cystectomy. *Ann R Coll Surg Engl*. 2013;95:200–6.
55. Traut U, Brügger L, Kunz R, et al. Systemic prokinetic pharmacologic treatment for postoperative adynamic ileus following abdominal surgery in adults. *Cochrane Database Syst Rev*. 2008:CD004930.
56. Moran J, Wilson F, Guinan E, McCormick P, Hussey J, Moriarty J. Role of cardiopulmonary exercise testing as a risk-assessment method in patients undergoing intra-abdominal surgery: a systematic review. *Br J Anaesth*. 2016;116(2):177–191.
57. O’Neill F, Carter E, Pink N, Smith I. Routine preoperative tests for elective surgery: summary of updated NICE guidance. *BMJ: Br Med J (Online)*. 2016;354.
58. Munro J, Booth A, Nicholl J. Routine preoperative testing: a systematic review of the evidence. *Health Technol Assess*. 1997;1(12):i–iv.
59. Katz RI, Dexter F, Rosenfeld K, Wolfe L, Redmond V, Agarwal D, et al. Survey study of anesthesiologists’ and surgeons’ ordering of unnecessary preoperative laboratory tests. *Anesth Analg*. 2011;112(1):207–212.
60. Lee TH, Marcantonio ER, Mangione CM, Thomas EJ, Polanczyk CA, Cook EF, et al. Derivation and prospective validation of a simple index for prediction of cardiac risk of major noncardiac surgery. *Circulation*. 1999;100(10):1043–1049.
61. Prytherch DR, Whiteley MS, Higgins B, Weaver PC, Prout WG, Powell SJ. POSSUM and Portsmouth POSSUM for predicting mortality. *Br J Surg*. 1998;85(9):1217–1220.
62. American College of Surgeons National Surgical Quality Improvement Program. The American College of Surgeons National Surgery Quality Improvement Program Mortality and Morbidity Risk Calculator. ACS NSQIP Surgical Risk Calculator. 2014.
63. van der Heijden MJ. Ribal JAWECNCCGGTLA. Muscle-invasive and metastatic bladder cancer. *European Association of Urology*. 2016.
64. Chappidi MR, Kates M, Patel HD, Tosoian JJ, Kaye DR, Sopko NA, et al. Frailty as a marker of adverse outcomes in patients with bladder cancer undergoing radical cystectomy. *Urol Oncol*. 2016;34(6):256.e1–256.e6.
65. Feely MA, Collins CS, Daniels PR, Kebede EB, Jatoi A, Mauck KF. Preoperative testing before noncardiac surgery: guidelines and recommendations. *Am Fam Physician*. 2013;87(6):414–418.

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66. The UCL/UCLH Surgical Outcomes Research Centre (SOuRCe) and The National Confidential Enquiry into Patient Outcome and

Death (NCEPOD). NCEPOD Surgical Outcome Risk Tool. SORT Surgery. 2014.