Advances in Surgery 50 (2016) 79–91
ADVANCES IN SURGERY

Strategies to Reduce Postoperative Urinary Tract Infections

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Keywords

• Urinary tract infection • Postoperative complications • Urinary retention
• Catheter-associated urinary tract infection • Hospital-acquired infection
• Quality improvement

Key points

- Postoperative urinary tract infection (UTI) is common and is associated with significant morbidity and cost.
- Urinary catheters are the most common cause of postoperative UTI, and interventions to reduce catheter use and duration are effective in preventing this complication.
- Multiple strategies have been demonstrated to reduce the incidence of UTI, including sterile catheter insertion technique, provider reminder systems, and early postoperative removal of catheters.
- Multifaceted and multidisciplinary approaches are necessary to change the culture of safety surrounding urinary catheter use.

INTRODUCTION

Urinary tract infection (UTI) is an important cause of postoperative morbidity in surgical patients. As the second leading cause of postoperative infections following surgical site infection, postoperative UTI contributes to increased costs, longer hospital stays, and increased mortality. Postoperative UTI has been shown to occur in association with other postoperative

Disclosure Statement: The authors have nothing to disclose.

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0065-3411/16/$ – see front matter
http://dx.doi.org/10.1016/j.yasu.2016.03.007

complications, thereby acting as a marker, if not a cause, of increased postoperative morbidity. Furthermore, treatment of UTI necessitates antibiotic use, which exposes patients to an array of risks and potential complications, such as antibiotic resistance and *Clostridium difficile* infection. In addition to these adverse consequences for the patient, there are now reimbursement penalties for hospital-acquired UTI, lending further incentive to the development and implementation of evidence-based strategies to reduce postoperative UTI.

Because emphasis on improving outcomes while controlling costs during the perioperative period remains a national priority, it is important to evaluate evidence surrounding the prevention of hospital-acquired infections (HAIs), such as postoperative UTI. This process requires a clear understanding of underlying causes, modifiable risk factors, strategies for identifying and targeting high-risk populations, development of evidence-based interventions, and effective implementation of such interventions. This article summarizes important measures and interventions in the prevention of postoperative UTI.

SIGNIFICANCE

Hospital-acquired UTI has historically been the leading cause of HAIs, previously accounting for approximately one-third of all such infections in the United States [1]. The most current prevalence survey performed by the Centers for Disease Control and Prevention (CDC) indicates that UTI now accounts for 13% of all HAIs, with an estimated 93,300 infections in the United States in 2011 [2]. Despite this relative improvement compared with other HAIs, the most recent National and State Healthcare-Associated Infections Progress Report based on data through 2013 identified a 6% increase nationally in catheter-associated UTI (CAUTI) rates between 2009 and 2013 [3]. Furthermore, this problem is particularly relevant in surgical populations because analysis of administrative data suggests that 70% of nosocomial UTIs occur in patients undergoing surgery at some point during their hospital stay [4]. In fact, UTI is the second most common type of postoperative infection following surgical site infection in patients undergoing small or large bowel resection [5]. Analysis of the American College of Surgeons National Surgical Quality Improvement Program database reveals that the crude rate of postoperative UTI within 30 days of surgery in all-comers is 1.7%, but with significantly higher incidence among certain subpopulations of surgical patients [6].

Accompanying the high prevalence of hospital-acquired UTI is significant morbidity for patients suffering this complication. In general, hospital-acquired UTI results in prolonged hospital stay, increased costs, and higher mortality [5,7–10]. In surgery patients specifically, UTI is similarly associated with worse outcomes. For example, analysis of patients undergoing colorectal resection for malignancy in the National Surgical Quality Improvement Program database demonstrated association of postoperative