# Urinary Retention in Surgical Patients

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**KEYWORDS**

• Urinary retention • Postoperative • Surgery • Bladder function

**KEY POINTS**

- Urinary retention, in some cases, is a preventable complication in general surgical patients in the postoperative setting.
- Urinary retention can be secondary to outlet obstruction, disruption of innervation to the bladder, or bladder overdistention.
- The goals for prevention should include identification of patients at risk. Risk factors known to be associated with increased risk of acute retention are age, medications, anesthetics, benign prostatic hyperplasia/lower urinary tract symptoms, and surgery-related factors, including operating room time, intravenous fluids, and procedure type.
- Diagnosis of urinary retention is best confirmed by bladder scan, as symptoms, such as pain and urge to void, are unreliable.
- The mainstay of initial management of urinary retention is placement of a Foley catheter. Alpha-blockers should be started, as they increase the likelihood of a successful voiding trial.

## URINARY RETENTION

Urinary retention in surgical patients is a common source of morbidity and can result in added costs that can potentially be avoided. Over the years, the urologic, general surgical, orthopedic, and anesthesia literature have addressed the problem; however, the definitions remain unclear with few if any guidelines for prevention and management. Recommendations for patients with increased baseline risk, that is, patients with known benign prostatic hyperplasia (BPH), are scarce as well. Studies on the topic are generally very heterogeneous with varying populations, operative conditions, and notably what constitutes retention. This article mainly focuses on the risk factors

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for and subsequent management of postoperative urinary retention (POUR) as it is commonly encountered by the general surgeon and has been shown to be responsible for up to 20% to 25% of unplanned admissions after ambulatory surgery.[1,2]

## Definitions

Urinary retention has taken on many definitions in the literature but can be best described as the inability to spontaneously and adequately empty the bladder. This definition is broad as it encompasses what has been described as acute versus chronic as well as complete versus incomplete retention. The categories are not mutually exclusive as both acute and chronic retention can be complete or incomplete and the literature has used a combination of other varying definitions making it very difficult to compare studies.

Acute urinary retention (AUR) is one of the few true urologic emergencies. The International Continence Society (ICS) defines AUR as a "painful, palpable or percussible bladder, when the patient is unable to pass any urine."[3] It can be spontaneous or secondary to surgery, medications, BPH, cerebrovascular accident, immobility, or anesthesia. In the case of BPH-related AUR, McNeil[4] found that differentiating between spontaneous and precipitated AUR was not important as the management did not change, whereas precipitated AUR unrelated to BPH may require altered management.

Chronic urinary retention is described by the ICS as "a non-painful bladder, which remains palpable or percussible after the patient has passed urine."[3] This definition includes patients with high postvoid residuals (PVRs) as well as those who fail a trial of voiding without a catheter placed for AUR. These patients often times require surgical intervention; however, given that long-term complication rates related to the retention are low,[5] conservative management may be considered based on unique patient factors.

At present, no precise definition of POUR exists, even among urologists. It is also very important to note that most cases of urinary retention are not associated with either a palpable or percussible bladder.

## Epidemiology

AUR is reported to occur in 0.2% to 0.6% of the general population.[6,7] This number increases to 2.0% to 3.8% in the general surgical population.[8,9] Several recent studies have reported POUR rates of up 14% to 16% in surgical patients overall. These differences may best be explained by the heterogeneity of surgical patient populations and the overall operative conditions as some types of procedures have drastically increased rates of POUR as compared with those evidenced in the general population. Two examples of these much higher rates of POUR are anorectal surgeries and total joint arthroplasties with reported rates of retention ranging from 20% to 48%[10–12] and 0% to 75%,[13] respectively.

## Pathophysiology

### Normal bladder function

Normal bladder function involves both the storage and emptying of urine. It is controlled by supraspinal and medullary centers via autonomic and somatic pathways (**Fig. 1**).

In order for micturition to occur, the external sphincter must relax via quiescence of the somatic innervation (pudendal nerve S2–S4) and the detrusor must then contract which requires activation of the parasympathetics (pelvic nerve S2–S4) and inhibition of sympathetics (hypogastric nerve T10–L2). During micturition, parasympathetic innervation also allows for urethral smooth muscle to relax.[14]