Surveillance in a setting of augmentation cystoplasty (adults):

On long-term follow-up leading causes of death in patients with spina bifida after bladder augmentation were nonurological infections rather than complications associated with augmentation (perforation, stones), malignancy, or renal failure.\(^1\)

Limitations: data in adults only (>18yrs old) is very limited. Data presented here includes the adolescent SB as well.

Level of evidence: LOE

Bladder stones and symptomatic UTI’s

Recommendation:
- Wash out bladder with high volume (≥240 ml) daily\(^2,3\) (LOE III & VI)
- Increase fluid intake in order to increase urine volume to >1.6 l/day\(^4\) (LOE VII)

Screening:
- Perform a cystoscopy if: ≥4 symptomatic UTI’s/yr, gross hematuria or microscopic hematuria >50 RBC/HPF, history of persistent abdominal or pelvic pain, or obstruction\(^2\) (LOE VII)
- Obtain Urine culture and KUB annually\(^2\) (LOE VII)

Perforation

Screening:
- Screen for risky behaviors such as substance (alcohol) abuse\(^2\) (LOE IV)

Recommendation
- Encourage compliance with scheduled intermittent catheterization (more than three times per day)\(^2\) (LOE IV)

Upper tract deterioration (renal scarring, hydronephrosis, calculus, decrease renal function)

Screening:
- Data is available only in postpubertal children\(^5\) (LOE IV)
- Screen for silent (asymptomatic) upper tract deterioration\(^2\) (LOE VII)
- Obtain history and physical exam annually (LOE VII)
- Obtain: renal bladder ultrasound, serum electrolytes, creatinine, cystatin C annually\(^2\) (LOE VII)
- UDS: 7 studies evaluate the role of UDS in children (including infants) as a screening tool for upper tract preservation. 6-12

**Recommendation**

- Encourage compliance with scheduled intermittent catheterization (more than three times per day) ² (LOE IV)

**Malignancy (for all NGB patients with or without enterocystoplasty)**

**Screening:**

- Avoid routine cystoscopy and cytology for detection of bladder malignancy. ¹³-¹⁵ (LOE IV)
- Hematuria alone should not be used as a screening tool for malignancies in patients with augmentation or catheterization. ¹⁶-¹⁸ (LOE IV)
- Prompt endoscopic evaluation (cystoscopy) and biopsy in the presence of: any new bladder changes such as increased urinary incontinence, recurrent UTI’s increased gross hematuria, or pain. (LOE VII)
- Perform endoscopy for patients above 50 years old who have colonic augmentation based on the same recommendations for routine colonoscopy. ¹⁹ (LOE VIII)

**Recommendation:**

- Be aware that bladder malignancy in SB population presents at a younger age and with more advanced and aggressive disease. ²⁰ (LOE IV)
- Be aware that due to the small absolute number of adult SB patients, the majority of studies on bladder cancer in patients with NGB have focused on spinal cord injury (SCI) patients. ²¹ (LOE VII)
- Be aware that to date, published data has been unable to identify enteric bladder augmentation as an independent risk factor for bladder malignancy in NGB setting. ¹⁶,²² (LOE IV)


