



# Non-Malignant Etiologies for Cystectomy: Trends from 2013-2020

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## INTRODUCTION

While radical cystectomy (RC) is the mainstay of treatment for muscle-invasive bladder cancer, simple cystectomy (SC) may be performed for a variety of non-malignant bladder conditions. Nonetheless, SC is far from simple; removal of the urinary bladder and creation of a urinary diversion is a major surgery with high complication rates. We seek to characterize the indications for which SC is performed including neurogenic bladder, interstitial cystitis, radiation cystitis, and fistulae. We aim to provide an updated analysis of the temporal and demographic trends from 2013-2020.

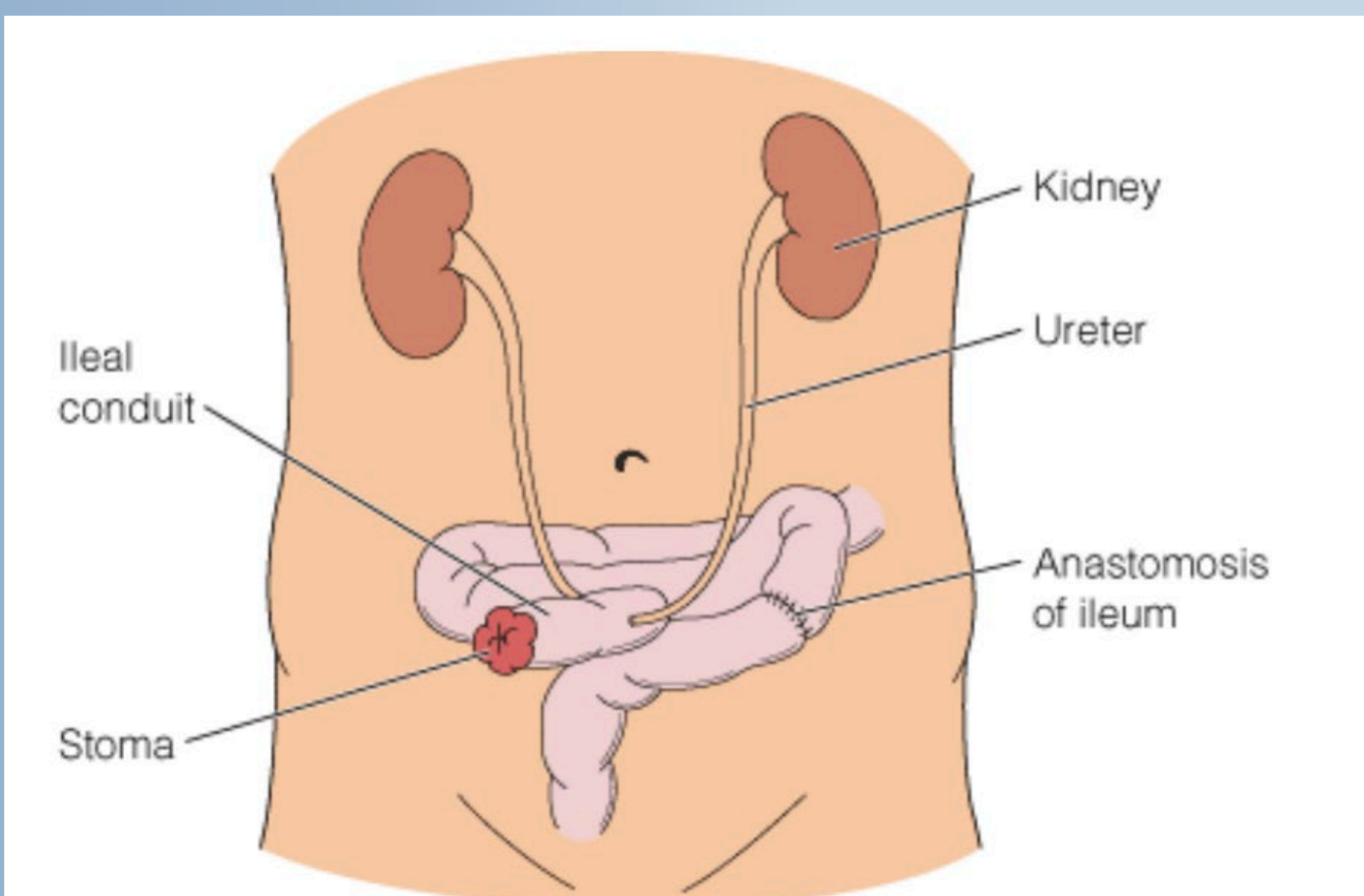


Figure 2. Simple Cystectomy with formation of an Ileal Conduit  
The British Association of Urological Surgeons (BAUS)

## METHODS

The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database was reviewed for patients undergoing SC. The non-malignant etiologies for SC were separated into 9 subgroups: anatomical, autoimmune, benign neoplasm, bladder outlet obstruction/ lower urinary tract symptoms / reflux, fistula, infectious, neurogenic, vascular, and other. ANOVA analysis was performed to assess for significant changes in indication frequency. A two-sided Z-test comparing frequencies of SC in 2013 vs 2020 was completed for each subgroup. Statistical significance was accepted at alpha of 0.05.

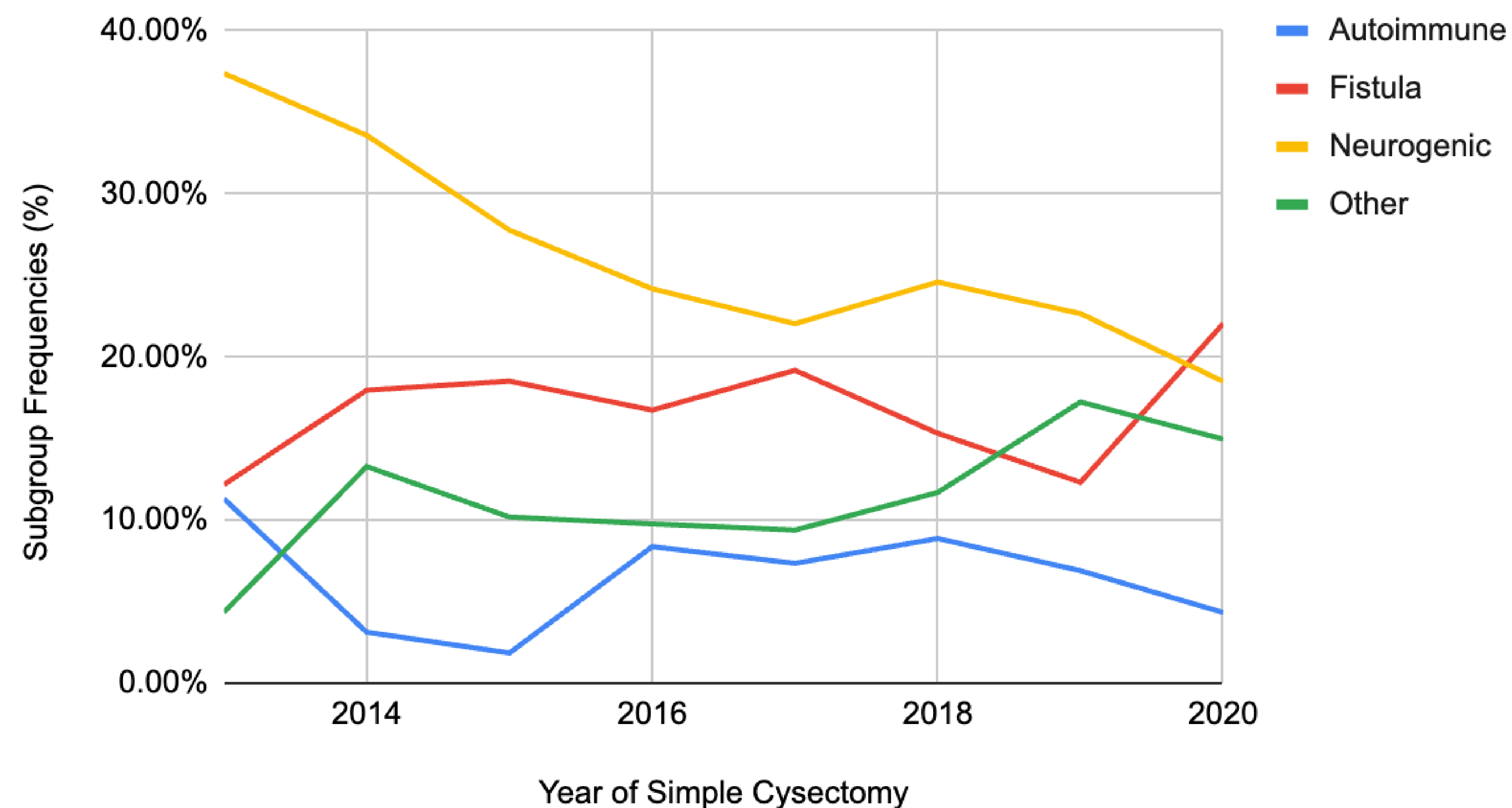
## RESULTS & DISCUSSION

- A total of 1,516 patients met inclusion criteria.
- Neurogenic bladder, fistula, and vascular were the most common indications with 376 (25%), 259 (17%), and 227 (15%) patients, respectively (Table 1).
- The average length of stay (LOS) for neurogenic etiologies was 11.05 days.
- The trends of neurogenic ( $p < 0.01$ ), other ( $p = 0.003$ ), autoimmune ( $p = 0.011$ ), and fistula ( $p = 0.025$ ) etiologies had a statistically significant decrease from 2013 to 2020 (Table 1).

Table 1. Frequency Table

Year	2013	2014	2015	2016	2017	2018	2019	2020	P-Value
<b>Total</b>	115	128	108	214	245	248	203	254	
<b>Anatomical (%)</b>	3 (2.61%)	3 (2.34%)	0 (0%)	6 (2.80%)	12 (4.84%)	7 (3.45%)	8 (3.15%)	8 (3.15%)	0.78
<b>Autoimmune (%)</b>	13 (11.3%)	4 (3.13%)	2 (1.85%)	18 (8.41%)	18 (7.35%)	22 (8.87%)	14 (6.9%)	11 (4.33%)	0.011
<b>Benign Neoplasm (%)</b>	2 (1.74%)	0 (0%)	1 (0.93%)	6 (2.34%)	2 (0.82%)	5 (2.02%)	5 (2.46%)	4 (1.57%)	0.91
<b>BOO/LUTS/Reflux (%)</b>	10 (8.7%)	9 (7.03%)	15 (13.89%)	26 (12.15%)	27 (11.02%)	32 (12.9%)	15 (7.39%)	21 (8.27%)	0.89
<b>Fistula (%)</b>	14 (12.17%)	23 (17.97%)	20 (18.52%)	36 (16.82%)	47 (19.18%)	38 (15.32%)	25 (12.32%)	56 (22.05%)	0.025
<b>Infectious (%)</b>	6 (5.22%)	14 (10.94%)	15 (13.89%)	22 (10.28%)	18 (7.35%)	21 (8.47%)	27 (13.30%)	25 (9.84%)	0.14
<b>Neurogenic (%)</b>	43 (37.39%)	43 (33.59%)	30 (27.78%)	52 (24.30%)	54 (22.04%)	61 (24.60%)	46 (22.66%)	47 (18.50%)	<0.001
<b>Other (%)</b>	5 (4.35%)	17 (13.28%)	11 (10.19%)	21 (9.81%)	23 (9.39%)	29 (11.69%)	35 (17.24%)	38 (14.96%)	0.003
<b>Vascular (%)</b>	19 (16.52%)	15 (11.72%)	14 (12.96%)	28 (13.08%)	50 (20.41%)	28 (11.29%)	29 (14.29%)	44 (17.32%)	0.85

Figure 1. Frequency of Simple Cystectomy by Subgroup



## CONCLUSION

From 2013-2020, the most common indication for SC was neurogenic bladder though there has been a statistically significant decrease in SC from 2013 to 2020. We observed that while cystectomy continues to have long LOS and high rates of complication, there has been a decrease in frequency with which SC is performed as more conservative management is pursued. While performing cystectomy for non-malignant conditions remains relatively rare, it is important to retrospectively look at the diagnoses that warrant this procedure. This information is of interest to urologists as they consider surgical versus non-surgical management of these benign diseases. The trends identified in this study will help define the prevalence of SC in treating non-malignant disease and the need for future research in this area.

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