Admissions for urinary tract infections are increasing for young adults with spina bifida in the United States, 2006 to 2016

Christopher Loftus MD[1], Jennifer Ahn MD[2], Judith Hagedorn MD[1], Mark Cain MD[2], Sarah Holt PhD[1], Paul Merguerian MD[2], Margarett Shnorhavorian MD MPH[2]
[1]University of Washington, Department of Urology, [2]Seattle Children's Hospital, Department of Urology

UNIVERSITY OF WASHINGTON UROLOGY

MP29-03

INTRODUCTION

- Due to improved medical care, the majority of children and adolescents with spina bifida (SB) are surviving into adulthood, resulting in a growing population of adults with SB in the United States.[1]
- These patients commonly seek emergency or inpatient care for potentially preventable causes including urinary tract infections (UTI), pressure ulcers, and urolithiasis.
- Transition of adolescents into adult urologic care is inconsistent and results in unmet health needs.[2] Transitional urology is an emerging field aiming to bridge care of patients with congenital conditions into adult care

Aim: To examine national trends for hospitalization in young adults with spina bifida

Hypothesis: There has been a decrease in proportion of inpatient admissions with urologic diagnoses due to the increasing nationwide focus on transitional and adult urologic care for this vulnerable population

METHODS

Dataset:

- National Inpatient Sample (NIS) for the years 2006-2016
  - All-payor admissions claims-based database
  - Sampling of 20% of US non-military discharges
  - Allows national population estimates
  - Statistical protocols and weights per HCUP standards
- Population
  - Group 1: SB admissions ages 18-25, N= 51,000
  - Group 2: SB admissions ages 26-33, N= 57,358
  - Group 3: General population (non-SB) admissions ages 18-25
    - N= 27,088,856, for comparison of change in billing/coding
  - Primary diagnoses identified by ICD-9/10 codes
  - Additional variables: demographics, length of stay, hospital costs, hospital-specific information
- Statistical Analysis
  - Trends over time period estimated by multivariate logistic regression with year as the exposure of interest
    - Covariates: year, age, gender

RESULTS

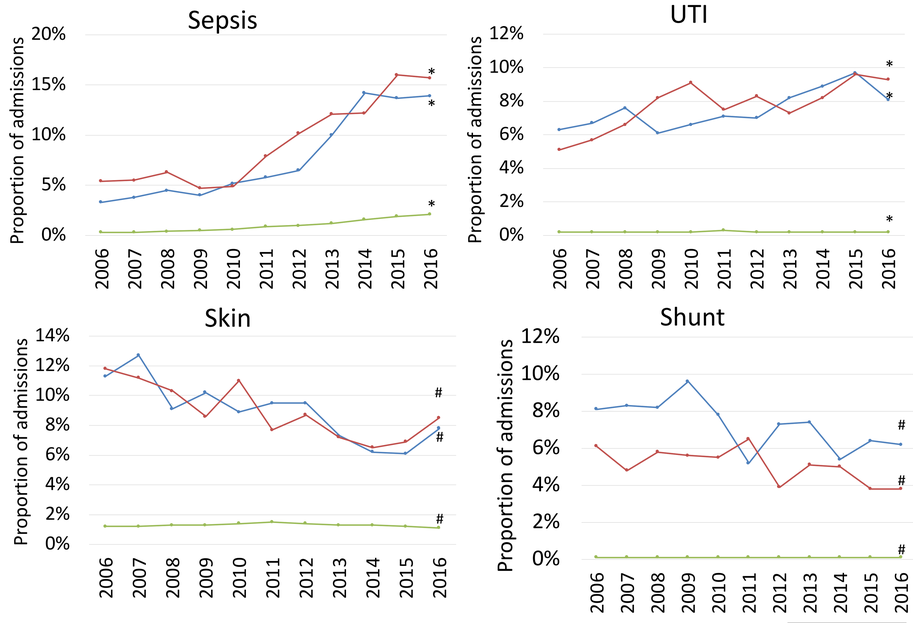

Figure . Percentage of admissions by primary diagnosis by year. * represents a statistically significant increasing trend and # represents a statistically significant decreasing trend over the course of the time period.

	Top Diagnoses for SB ages 18-25
1.	UTI/ Pyelonephritis - 11.0%
2.	Pregnancy-related - 9.6%
3.	Skin infections/chronic ulcers - 9.1%
4.	Sepsis - 7.7%
5.	Shunt-related - 7.5%
6.	Complications of surgical procedures or medical care - 3.3%
7.	Pneumonia - 1.7%

Decreasing	No change	Increasing
• Skin conditions OR 0.934 (CI 0.925-0.943) • Shunt conditions OR 0.958 (CI 0.948-0.968) • Pregnancy OR 0.964 (CI 0.954-0.974)	• Nephrolithiasis OR 0.980 (CI 0.958-1.001) • Respiratory failure OR 0.995 (CI 0.967-1.024) • Osteomyelitis OR 1.012 (CI 0.996-1.029)	• UTI OR 1.040 (CI 1.029-1.051) • Sepsis OR 1.201 (CI 1.188-1.215) • Acute kidney failure OR 1.060 (CI 1.028-1.092)

- SB admissions represent 0.2% of all admissions for the 18-25 age group (51,000/27,088,856) and increased 29.3%
- UTI was the most common primary diagnosis and it is increasing for SB admissions ages 18-25
- Sepsis had largest increase and had longest mean length of stay (9.0 days SD13) and the highest total mean hospital costs ($70,402 SD110,810)
- "Preventable" diagnoses accounted for 37.8% of admissions and were increasing for both SB groups OR 1.034 (CI 1.028-1.040)

CONCLUSION

- There is a large and growing need of longitudinal care for SB young adults
- The large increase in sepsis (321% increase) was also see in comparison groups and this trend has been shown in other studies[3]. Potential causes include increased surveillance and detection of sepsis, a sicker population, or national changes in billing/coding for hospital admissions
- The increase in UTI for SB patients 18-25 was greater than the general population. This could be due to lack of preventative care, bacterial antibiotic resistance, and a population with more comorbidities (obesity increased 140% for these patients).
- Skin conditions, shunt complications and pneumonia decreased in the SB populations possibly indicating improved preventative care for these conditions

LIMITATIONS

- NIS is a database of admissions, cannot follow patients over time or account for repeat admissions
- Relies on proper billing and coding and this may be prone to multiple biases
- Lack more detailed information about each admission

References
1. Mukherjee et all Care for Adults with Spina Bifida: Current State and Future Directions. Top. Spinal Cord Inj. Rehabil. 2017; 23: 155–167.
2. Szymanski KM, Cain MP, Hardacker TJ, et al: How successful is the transition to adult urology care in spina bifida? A single center 7-year experience. J. Pediatr. Urol. 2017; **13**: 40.e1-40.e6.
3. Stoller J, Halpin L, Weis M, et al: Epidemiology of severe sepsis: 2008-2012. J. Crit. Care 2016; **31**: 58–62.