# Predictors of Cost Effectiveness of Ureteroscopy in A Large Healthcare System

Sari Khaleel, PGY4

Department of Urology, University Of Minnesota

UNIVERSITY OF MINNESOTA
Driven to Discover®

# Introduction and Objective

- Ureteroscopy with holmium laser lithotripsy (URS HLL) is the most common surgical management for urolithiasis
- There has been a drive to standardize treatment and improve cost-effectiveness of care
- We sought to assess whether variation in surgical staff, site, and patient characteristics affected URS HLL cos-effectiveness in a large multi-hospital system

# Methods

- Our hospital EMR (Epic systems; Madison, WI) was retrospectively searched for URS HLL with/without stent placement (CPT codes 52356/52353) done over 1 year
- Data was analyzed using *Gopher*, a program that we developed in Perl programming language to compile and analyze raw EMR data
- Primary outcomes: mean case time (total/"door-to-door" and operating time), number of disposable items (DI's), and hospital-incurred disposable item cost (DIC)

# Methods

- Sites were defined as high- or low-volume based on whether their case volume was above or below median case volume, respectively
- Pre-operative morbidity was assessed using the American Society of Anesthesiologist (ASA) physical status score
- Multivariate analysis using linear regression focused on surgeons who performed ≥ 20 procedures at ≥ 2 sites
- ANOVA was used to assess outcome variation across sites

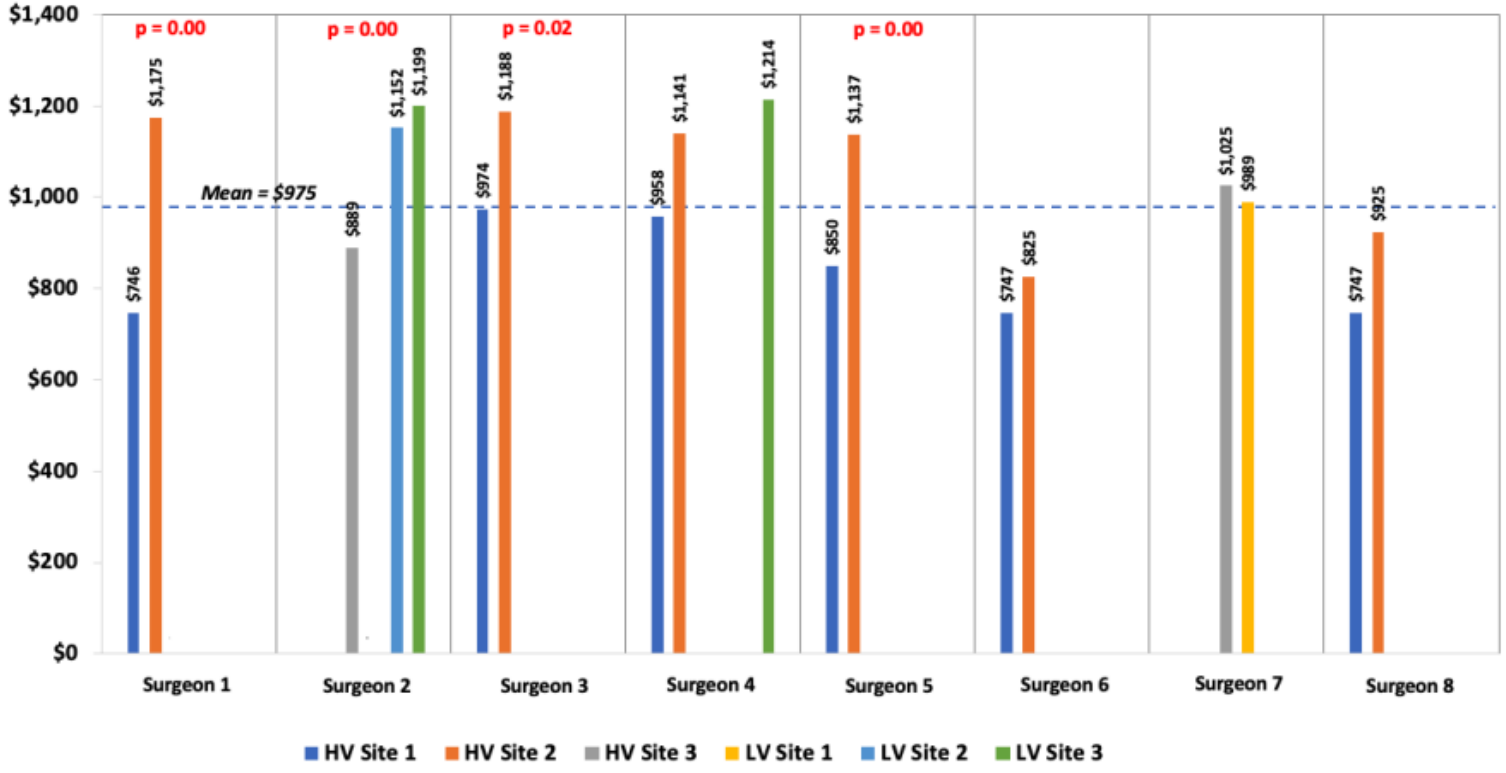
# Results

- 1,078 cases were performed by 34 surgeons
  - Mean DIC: $978 (Range: $389- $1,862)
  - Median case volume: 100 cases
- Operating time and total case time were significantly shorter at high volume compared to low volume sites
  - 38.4 vs 65.3 minutes; 64.2 vs 100.2 minutes; T-test p-value < 0.000
- The number and cost of utilized items varied across sites (ANOVA p-value < 0.001)

# Results: multivariate analysis

- Surgeons who performed ≥ 20 procedures at ≥ 2 sites
  - 8 surgeons, 368 cases
  - 6 sites (3 HV, 3 LV sites; median case volume = 80)
- Mean case DIC, total/operating time, and number of DI's varied significantly across sites (ANOVA p = 0.000 for all)

# Results: multivariate analysis



# Results: multivariate analysis

- Site was the only significant predictor of DIC ($p = 0.000$)
  - Adjusting for surgeon and site volume status (high or low volume)
- Site and surgeon were both significant predictors of the number of used disposable items ($p = 0.000$)
- Site volume status (high/low) and patient ASA score were the only significant predictors for operating and total case time
  - $p < 0.05$, adjusting for individual site and surgeon

# Conclusions

- Surgical site was the only significant predictor of disposable item cost
- Site and surgeon were significant predictors of the number of used items
- Site volume status and patient ASA score were the only significant predictors of operative and total case time
- Potential confounders: stone burden, anatomy (stone location), patient comorbidities, and flexible vs semirigid ureteroscopy

# University of Minnesota

## Driven to Discover®

Crookston Duluth Morris Rochester Twin Cities